Best Practices in Environmental Education Fields Trips: The Importance of Curricular Integration, Preparation, and Follow-up

A Field Project
SUBMITTED TO THE FACULTY OF
UNIVERSITY OF MINNESOTA
BY

Kathleen Floberg

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF ENVIRONMENTAL EDUCATION

Adviser: Ken Gilbertson, Ph.D. _____

May, 2015

Acknowledgements

I would like to thank my advisor, Ken Gilbertson, for providing me with constant support and guidance. I would also like to thank my Committee for providing great ideas and feedback throughout this process. In addition, I'd like to thank everyone who has listened to me over the past two years as I have worked through all the kinks and setbacks that come with writing a very long paper.

Dedication

I would like to dedicate this work to the Widjiwagan Outdoor Learning Program for leading me towards a career in environmental education.

Abstract

There is a large body of research extending across multiple disciplines that indicate how to implement a field trip so it reaches optimal educational potential. Past research shows that more comprehensive preparation and follow-up leads to a better learning experience. This study describes the preparation and follow-up Minnesota teachers conduct with their students before and after an extended field trip to a residential environmental learning center (RELC), how these teachers connect such trips to formal curriculum, and the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities was determined. Results show that there are inconsistencies between the RELCs in terms of the resources they provide to teachers before and after field trips. Teachers welcome preparation and follow-up materials but face similar barriers to integrating field trips into their formal curriculum as those that have been stated in research for over 30 years. In addition, the types of preparation and follow up teachers conduct with their students fall on a wide spectrum, similar to past research findings. This was an initial step towards a greater understanding of how extended field trips to RELCs in Minnesota can be integrated into the formal classroom and what research efforts are needed to support these understandings.

Table of Contents

List of Tables

List of Figures

Chapter One

Introduction

Background

The complexity of environmental issues; deficiencies in public awareness, knowledge, attitudes, and behaviors surrounding these issues; and children's general lack of emotional connection and knowledge of the environment which surrounds them, makes the presence of Environmental Education (EE) in all levels of education a high priority (Nabhan, 1995; Storksdieck, 2006). Many strategies are used to integrate EE into formal education, including the infusion of environment-related themes throughout a curriculum, the presence of a separate course dedicated to environmental studies, and field trips with an environmental education focus (Disinger & Howe, 1990; Environmental Education & Training Partnership, 2004).

The value of field trips to non-formal and informal learning environments as a supplement to formal education has been widely researched and supported (Anderson, Kisiel, & Storksdieck, 2006; DeWitt & Storksdieck, 2008; Erdogan, Usak, & Bahar, 2013; Manzanal, Barreiro, & Jimenez, 1999; Orion, 1993; Storksdieck, 2006; Tal, Alon, & Morag, 2014). These settings include museums, aquariums, zoos, and residential and nonresidential environmental learning centers. Field trips to these settings provide concrete, hands-on learning experiences that cannot be replicated in the classroom or laboratory and often pave the way for the learner to understand more abstract concepts (DeWitt & Osborne, 2007; Morag & Tal, 2012; Orion, 1993). However, these benefits are not often realized due to inadequate curricular integration, preparation and follow-up on the experience (Anderson et al., 2006; Kisiel, 2005; Storksdieck, 2006; Tal et al., 2014). Barriers which prevent an integrated experience include insufficient time,

resources, and teacher experience and training with field trip pedagogy, environmental education, and the settings in which it is most often delivered (Anderson et al., 2006; Carrier, 2009; Coughlin, 2010; DeWitt & Storksdieck, 2008; Kisiel, 2013; Orion, 1993; Orion & Hofstein, 1994; Rebar, 2012; T. Tal et al., 2014).

Studies have shown that without proper preparation, follow-up, and connectedness to formal curriculum, the field trip experience is at risk of being underutilized (DeWitt & Storksdieck, 2008; Orion, 1993; Tal et al., 2014). Falk et al. (1978) introduced the concept of the *Novel Field-trip Phenomenon* which postulates that a child is unable to focus on a structured learning activity when placed in a novel environment. This and many subsequent studies have supported the hypothesis that the degree of familiarity a child has with a setting influences their behavior and cognition (Hurd, 1997; Kubota & Olstad, 1991; Orion & Hofstein, 1991). When a child is placed in a novel setting, they may display uncharacteristic levels of exploratory behavior, can be unable to focus on structured tasks, and may display lower levels of learning than those placed in a more familiar environment (Falk, Martin, & Balling, 1978; Kubota & Olstad, 1991; Orion & Hofstein, 1994). Orion (1993) proposed a model for the proper implementation of field trips which stresses the importance of participant preparation for a field trip to reduce the novelty of the field trip environment. In a review of literature on field trips, DeWitt and Storksdieck (2008) determined that learning outcomes are strongly correlated to quality preparation and follow-up.

The benefits of preparation before field trips are also supported by various learning theories. A constructivist theory of learning proposes that people come into any experience with knowledge which will be built upon (Bodner, 1986; Dillon et al., 2006; Morag & Tal, 2012). Those preconceptions determine how a learner will understand and

organize new information, and therefore new experiences must be relevant and relatable in order for learning to occur (Ausubel, 1962; Storksdieck, 2006). David Ausubel's Subsumption Theory reasons that meaningful learning occurs when new information is linked to existing relevant concepts in a person's cognitive structure (Ausubel, 1962; Novak, 1976). Both these learning theories argue that what a person can and will learn depends on what they already know. Hence, quality preparation before a field trip has the potential to greatly impact a child's learning experience. While preparation reduces the novelty of the setting and provides a base of knowledge before a field trip, follow-up activities to a field trip are also important because they strengthen connections and provide additional context for the experience (Anderson et al., 2006a).

In the model for the development and implementation of field trips, Orion (1993) states that the field trip itself is only part of the whole learning process. According to this model, field trips are meant to provide concrete experiences, address primary concepts and should be integrated into the formal curriculum. These experiences are the basis from which more abstract concepts should be addressed and followed up on back in the classroom after the field trip (Orion, 1993). This model is widely supported throughout field trip literature and provides the basis for contemporary best practices in field trips to non-formal and informal learning environments (Anderson et al., 2006; Carrier, 2009; DeWitt & Storksdieck, 2008; Kubota & Olstad, 1991; Orion, 1993; Storksdieck, 2006; Tal et al., 2014). The importance of integration between the field trip experience and the formal curriculum and how these connections facilitate meaningful learning is also addressed and recognized throughout the literature (Anderson et al., 2006; Carrier, 2009; DeWitt & Storksdieck, 2008; Orion, 1993; Tal et al., 2014). Both teachers and external providers of environmental education contribute to this goal. The burden of providing

connections to formal curriculum should not fall on one party alone, but should be realized through open dialogue and coordination between all those involved (DeWitt & Storksdieck, 2008).

Extensive research has focused on single-day excursions to museums, planetaria, nature centers, and natural environments to conduct field work. In contrast, there is a smaller body of literature focused on multi-day field trips to residential and environmental learning centers (RELCs) and the way these experiences are integrated into formal education. Understanding the role of extended field trips to RELCs in formal curriculum is important for many reasons. Studies aimed at how teachers approach preparation and follow-up for such trips can guide other teachers in the future. In addition, if teachers feel as though they are not adequately supported and/or do not have the resources to facilitate quality preparation and follow-up with their students, further research may help determine what support is needed to better connect formal and non-formal education.

One way to approach this issue would be to gather the perspectives of teachers whose classes participate in extended field trips to RELCs focused on environmental education, and the perspectives of the education and/or program directors of RELCs which provide environmental education programming. These two perspectives could elucidate if current implementation of field trips to RELCs align with what previous studies and research deem to be "best practices" for field trips.

Purpose Statement

The purpose of this study was to describe the preparation and follow-up Minnesota teachers conducted with their students before and after an extended field trip to a residential environmental learning center. This study also described how these

teachers connected such trips to formal curriculum. In addition, the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities was determined.

Research Questions

The following research questions guided the study:

1. How do teachers connect outdoor learning experiences at RELCs with the formal classroom curriculum through preparation and follow-up activities?
2. How do RELCs support the integration of the field trip into formal education?
3. What do teachers perceive as being needed to support curricular integration and their preparation and follow-up efforts for an extended field trip to an RELC?

Definitions of Terms

This section defines the concepts addressed in this study and, when necessary, how they are operationalized. The process of defining and operationalizing key terms follows the recommendation of concept specification (Babbie, 2011).

Field Trip.

A type of experiential learning undertaken for educational purposes where a group of students leave the traditional formal classroom setting and go somewhere where the materials for instruction may be observed and studied directly in an authentic setting (Krepel & Duvall, 1981). This study will specifically look at field trips to residential environmental learning centers (RELC) where students spend one or more nights on-site.

Outdoor Education.

Outdoor Education can be considered an experiential process of learning by doing, which takes place primarily through exposure to the out-of-doors. The emphasis

for the subject of learning is placed on relationships concerning people and natural resources (Priest, 1986).

Environmental Education.

Environmental education is a process that aims to develop a world population that is aware of, and concerned about, the total environment and its associated problems. Further, environmental education aims to develop a world population that has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (UNESCO-UNEP, 1976).

Formal Education.

Education that takes place in a planned way at a recognized institution. The learning environment is pre-arranged, attendance is compulsory, and assessment is included and/or expected (Tamir, 1991).

Non-formal Education.

Education that takes place in a planned but highly adaptable way at a non-school institution. The learning environment is pre-arranged, attendance is voluntary, and formal assessment is not expected (Tamir, 1991).

Residential Environmental Learning Center (RELC).

A residential environmental learning center has been defined as being a professionally staffed, full-time, year-round facility which offers hands-on, outdoor-based environmental education (EE) over an extended visit. (SEEK, 2014).

Novelty.

The presence of new, unfamiliar, or relatively rare stimuli against a background of familiar events in the child's perceptual history (Alberti & Witryol, 1994)

Limitations

This study will be restricted to teachers and RELCs in Minnesota, and the results will not be representative of all teachers who take their classes on extended field trips to RELCs. This study will also rely on self-reporting by participants which can have inherent weaknesses in its design (Babbie, 2011).

Assumptions

- Field trips to RELCs are focused on environmental education.
- Teachers find educational value in bringing their classes to RELCs.

Significance

There is a large body of research extending across multiple disciplines that indicate how to implement a field trip so it reaches optimal educational potential. This research shows that more comprehensive preparation and follow-up leads to a better learning experience (Morag & Tal, 2012; Orion, 1993; Storksdieck, 2006). However, teachers and providers of field trips are continually faced with barriers which prevent them from being utilized to their full educational potential (Anderson et al., 2006; Carrier, 2009; Coughlin, 2010; DeWitt & Storksdieck, 2008; Orion & Hofstein, 1994). Teachers receive little to no formal training specific to field trip pedagogy (Kisiel, 2013; Rebar, 2012), and educational standards and the demands of formal curriculum do not allow for adequate time to be dedicated to the preparation and follow-up of field trips (Anderson et al., 2006; Griffin, 2004; Kisiel, 2005; Rickinson et al., 2004). Non-formal and informal field trip providers often are unsure how to best support teachers, and these institutions have their own educational agendas which may or may not align with the goals and objectives of teachers who bring their classes to these sites (Anderson et al., 2006; Storksdieck, 2006). Research on this topic has been more focused on single-day

field trips to museums, zoos, aquarium, nature centers, etc., with few addressing extended field trips to RELCs. This study will identify how field trips in environmental education to RELCs are being implemented currently and if there are opportunities to more closely align present practices with identified “best practices.”

Chapter Two

Literature Review

This chapter summarizes research on the benefits of field trips and how they enhance student learning, the importance of curricular integration, theoretical support for the learning benefits of field trips, models for best practices in field trips, and barriers to achieving these best practices.

Benefits of Field Trips in Environmental Education

> Go my children, burn your books. Buy yourself stout shoes; get away to the mountains, the deserts, and the deepest recesses of the earth. Mark well the distinction between animals, the differences among plants, the various kinds of mineral. In this way, and no other, will one gain knowledge of things, and of their properties. (Severinus, 1571)

The importance of experiential learning as an integral part of a child's education is not a recent view, as indicated by the quote above from the 16th century. The various benefits of field trips are widely recognized throughout the literature (Coughlin, 2010; Dettmann-Easler & Pease, 1999; DeWitt & Storksdieck, 2008; Dillon et al., 2006; Falk & Balling, 1982; Farmer, Knapp, & Benton, 2007; Michie, 1998; Nadelson & Jordan, 2012; Orion, 1993; Rickinson et al., 2004; Tamir, 1991). In their review of research on outdoor learning, Rickinson et al. (2004) found that "fieldwork, properly conceived, adequately planned, well taught and effectively followed up, offers learners opportunities to develop their knowledge and skills in ways that add value to their everyday experiences in the classroom" (Rickinson et. al., 2004, p. 14). Teachers also acknowledge the benefits that field trips provide and believe they "will complement and enhance their students' understanding" (Anderson et. al., 2006, p. 365). Teachers perceive the positive effects of

field trips to include the opportunity for hands-on experiences, quality education, improvement in students' attitudes and motivation toward the subject, and opportunities to utilize other learning strategies such as experiential and cooperative learning (Kisiel, 2005; Michie, 1998).

Research has also found that field trips to outdoor settings and for environmental education purposes can increase students' environmental literacy and ecological knowledge, while positively influencing their attitudes towards the environment (Ballantyne & Packer, 2002; Bogner, 2002; Dettmann-Easler & Pease, 1999; Dillon et al., 2006; Erdogan et al., 2013; Farmer et al., 2007; Gilbertson, 1990; Knapp & Poff, 2001; Lisowski & Disinger, 1991; Stevenson, Peterson, Bondell, Mertic, & Moore, 2006). For example, Dettmann-Easler & Pease (1999) found that students who participated in residential environmental education programs demonstrated significantly more positive attitudes towards the environment, as measured by attitudes towards wildlife, than their counterparts who participated in an in-class wildlife program. This supports a study conducted by Gilbertson (1990) which found that students who participated in an extended field trip to a residential nature center were more environmentally literate than students who had no field experience or who had attended only a one-day field trip. This study also highlights how the benefits of field trips to outdoor settings are affected by the length of the experience, with longer trips increasing the positive effects.

Not only has research shown the benefits of outdoor learning, studies have also found that such experiences can leave positive, lasting impression on the participants. As Falk & Dierking (1997) refer:

> Overall, 96 percent of all subjects queried could recall a school trip, and a majority could remember the age at which they went on the trip, how they got there, and with whom they went. Virtually all of the subjects would recall at least one specific thing from the trip and most of the subjects said that they had thought about the trip subsequently. (p. 211)

Farmer et al. (2007) looked at the long-term effects of an all-day field trip to the Great Smokey Mountains National Park on fourth grade students in Tennessee. Through phenomenological analysis, the researchers determined that the majority of fourth grade students interviewed retained environmental and ecological content knowledge one year after the field trip took place. In a similar study focused on the immediate and short-term impact of an environmental education field trip, Knapp and Poff (2001) found that fourth grade students who participated in an environmental interpretive program at a U.S.D.A. Forest Service site were able to recount various aspects of the field trip and continued to have positive recollections of the resource site four months after the program. This study also addressed the role that hands-on, action-based activities can have on participants' memories of an experience. Through interviews with the study participants, the researchers found higher recall of experiences that were active and tactile versus ones that were passive and didactic.

> These actions become the foundation for the recall of other aspects of the interpretive experience. The actual tasks that were accomplished by the students were important recall mechanisms for many of the students. For example, the act of looking for natural items during the scavenger hunt was the 'root' memory for these children and any other information recalled from this game extended from those actions. (Knapp & Poff, 2001, p. 60)

These findings, which indicate that memory is affected by the activity level of the student, are reflected in the theory of Brain Based Learning (Caine & Caine, 1990; Davidson & Carber, 2009)

Brain Based Learning Theory

The theory of Brain Based Learning was outlined by Renate and Geoffrey Caine (1990). This theory takes a systems view and postulates that people are holistic learners. Our cognitive, affective, and kinesthetic domains interact to construct knowledge. This interplay of attention, emotion, and movement enhance both memory and learning (Caine & Caine, 1990; Davidson & Carber, 2009; Duman, 2010; Glisczinski, 2011). In their article, Caine and Caine lay out twelve principles that form the theoretical foundation for Brain-Based Learning (Caine & Caine, 1990, p. 66-69):

1. The brain is a parallel processor
2. Learning engages the entire physiology
3. The search for meaning is innate
4. The search for meaning occurs through "patterning"
5. Emotions are critical to patterning
6. Every brain simultaneously perceives and creates parts and wholes
7. Learning involves both focused attention and peripheral perception
8. Learning always involves conscious and unconscious processes
9. We have two types of memory: a spatial memory system and a set of systems for rote learning
10. The brain understands and remembers best when facts and skills are embedded in natural spatial memory
11. Learning is enhanced by challenge and inhibited by threat

12. Each brain is unique

"These principles are simple and neurologically sound. Applied to education, however, they help us to re-conceptualize teaching by taking us out of traditional frames of reference and guiding us in defining and selecting appropriate programs and methodologies" (Caine & Caine, 1990, p. 66). Some of these principles help establish the importance of field trips as an educational tool.

Principle three: the search for meaning is innate, means that the brain automatically registers the familiar while simultaneously searching for the new. According to this principle, "Brain-based education must furnish a learning environment that provides stability and familiarity. At the same time, it should be able to satisfy the brain's enormous curiosity and hunger for novelty, discovery, and challenge" (Caine & Caine, 1990, p. 67). Many field trip settings have the potential to provide these novel experiences that motivate students to explore, discover, and learn. *Principle five: emotions are critical to patterning*, explains that emotion and cognition are linked. Our memories are linked to the emotions we experienced when the memory formed, one cannot be recalled without the other. This principle has implications for field trips. Numerous studies support the view that field trips provide both cognitive and affective learning opportunities for participants (Anderson et al., 2006; DeWitt & Storksdieck, 2008; Eshach, 2007; Rebar, 2012; Tal, 2001). Per the theory of Brain Based Learning, these affective experiences have the potential to enhance memory and learning (Caine & Caine, 1990; Davidson & Carber, 2009). Another principle of Brain-Based Learning that has important implications for field trips is *Principle ten: the brain understands and remembers best when facts and skills are embedded in natural spatial memory*. "Spatial memory" is produced by experiential learning; learning is enhanced when it is rooted in

direct experiences. Field trips provide these real-life experiences and can enhance memory through hands-on, experiential learning.

In conjunction with Brain-Based Learning, the theories outlined below have important implications for how field trips are used as educational tools and provide additional support for the role of field trips in a child's education.

Constructivism and Subsumption Theories

The educational philosophy of John Dewey presented in *Experience and Education* (1938) advocates for education grounded in real experiences. According to Dewey, learning is determined by the experiences an individual has, and any experience is fundamentally educative if it can be used to interpret or inform future experiences (Dewey, 1938). This view of how experience and education are linked influenced Jean Piaget's theory of Constructivism which argues that knowledge is constructed in the mind of the learner (Bodner, 1986; Dillon et al., 2006; Storksdieck, 2006). The essential elements of Constructivism are that learners construct knowledge through experience, that a learner's prior knowledge and preconceptions influence future learning, and that an experience must have personal meaning (it must be relatable to prior knowledge and experience) if it is to be educative (Lisowski & Disinger, 1991; Storksdieck, 2006).

Constructivism provides important theoretical support for the educational benefits of field trips. Field trips, especially ones at RELCs, are largely experiential in nature and provide an opportunity for students to actively construct knowledge and meaning through direct interactions with their surroundings (Morag & Tal, 2012; Orion, 1993; Tal, 2001). However, the educational benefits of field trips may not be realized if treated as an isolated experience and not integrated into formal curriculum (Anderson et al., 2006; DeWitt & Storksdieck, 2008). As outlined above, a learner's prior knowledge is a

significant determinant of future learning. Therefore, in order to maximize field trips learning potential, students need to have prior knowledge which is relatable to the content of the field trip (Ausubel, 1962, 1968; Orion, 1993). This view is also supported by David Ausubel's Subsumption Theory. Subsumption Theory focuses on the factors which influence meaningful learning, learning where new information is linked with existing concepts in cognitive structure (Ausubel, 1962).

Ausubel represented the Subsumption Theory with the following equation (Ausubel, 1968, p. 107)

subsumtion: A + a = A'a'

A: Existing concept in cognitive structure

a: new, relevant information to be learned

A'a': modified concept in cognitive structure

Conversely, "rotely learned materials are discrete and isolated entities which have not been related to established concepts in the learner's cognitive structure. Because they are not anchored to existing ideational systems, rotely learned materials are much more vulnerable to forgetting" (Ausubel, 1963, p. 217). To summarize the Subsumption Theory, Ausubel (1968) stated that, "If I had to reduce all of educational psychology to just one principle I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly" (p. vi).

Both the Subsumption Theory and Constructivism have important implications for how field trips are used within an educational framework. Without adequate preparation, students might not begin a field trip with enough prior knowledge and experience to construct new knowledge from their experience. This is especially true if

the field trip introduces new concepts students have never been exposed to through school or at home.

The importance of adequate preparation is also underscored by the role of novelty in the learning process (Alberti & Witryol, 1994; Berlyne, 1960; Falk et al., 1978). The following section summarizes the influence of novelty in a field trip setting.

Novelty

Alberti and Witryol (1994) define novelty as "the presence of new, unfamiliar, or relatively rare stimuli against a background of familiar events in the child's perceptual history" (p. 130). According to Daniel Berlyne, novelty is one of the main stimuli that will elicit curiosity (Berlyne, 1960). These curiosity-inducing stimuli include novelty, incongruity, uncertainty, and complexity, and produce explorative behavior which can only be reduced by the acquisition of knowledge (Alberti & Witryol, 1994; Berlyne, 1960). "In a novel or curious situation, a learner is desirous to minimize or reduce the amount of uncertainty, thereby increasing motivation to learn" (Hurd, 1997, p. 30). Field trips, therefore, as novel settings can be used as resources to enhance student motivation to learn. However, as always, there is the possibility of too much novelty for students. Research has shown that excessive novelty, like the stimulus-rich environment many field trip settings provide, can instead reduce students' learning (Falk et al., 1978; Hurd, 1997; Kubota & Olstad, 1991; Martin, Falk, & Balling, 1981; Orion, 1993).

The novelty of the field trip setting can detract from students' attention on structured learning tasks while they are engaged in exploratory behavior (Falk et al., 1978).

Most educators who work in outdoor education settings are familiar with the disoriented, uneasy feelings displayed by some children visiting the site for the

> first time; feelings that even after a reasonable lapse of time persist and are expressed by uncharacteristically active, excited, and explorative behaviors. (Falk et. at., 1978, p. 127)

Falk et al. (1978) looked at the effect of setting novelty on a child's behavior and cognition during a field trip. The researchers hypothesized that "a person's ability to attend to a structured learning task in a novel setting improves with time because behaviors interfering with such learning decreases with time spent in the setting" (p. 128). The results of this study supported the hypothesis that the degree of familiarity with a setting affects learning during a field trip. Falk et al. (1978) termed this phenomenon the *Novel Field Trip Phenomenon*.

In a study measuring the effects of a school field trip on third and fifth grade students' attitude, behavior, and learning, Falk and Balling (1982) found that each of the three variables were influenced by both developmental level of the students and the novelty of the setting. Half the students from each grade went on an all-day field trip to a nature center to learn about the biology of trees, while the other students were taught the same lesson on the school grounds. Two contradictory hypotheses guided this study: students on the field trip at the nature center will learn and remember more since novel events stand out against day-to-day routine (Berlyne, 1960; Falk & Balling, 1982) and the novelty of the all-day field trip to the nature center will impede learning because students will not be able to focus on task-directed learning (Falk et al., 1978). The findings of this study, presented in Figure 1, indicate that both developmental stage and environmental context can affect learning on field trips. The fifth graders demonstrated less off-task behavior and increased learning at the nature center (higher novelty) versus at school (lower novelty) while the opposite was true of the third graders. Through observations,

the researchers categorized the off-task behavior demonstrated by the fifth graders in the less novel setting as "exploration," while the off-task behaviors of the third graders in the more novel setting was designated as "watching peers." This may suggest that the fifth graders were more bored in familiar surroundings and were seeking out stimuli, while the third graders were looking to each other for clues on how to act in an "uncomfortably novel situation" (Falk & Balling, 1982, p. 26). Falk and Balling (1982) suggest that in order for educational field trips to maximize learning, students should be placed in settings of appropriate novelty dependent on the developmental level of the participants.

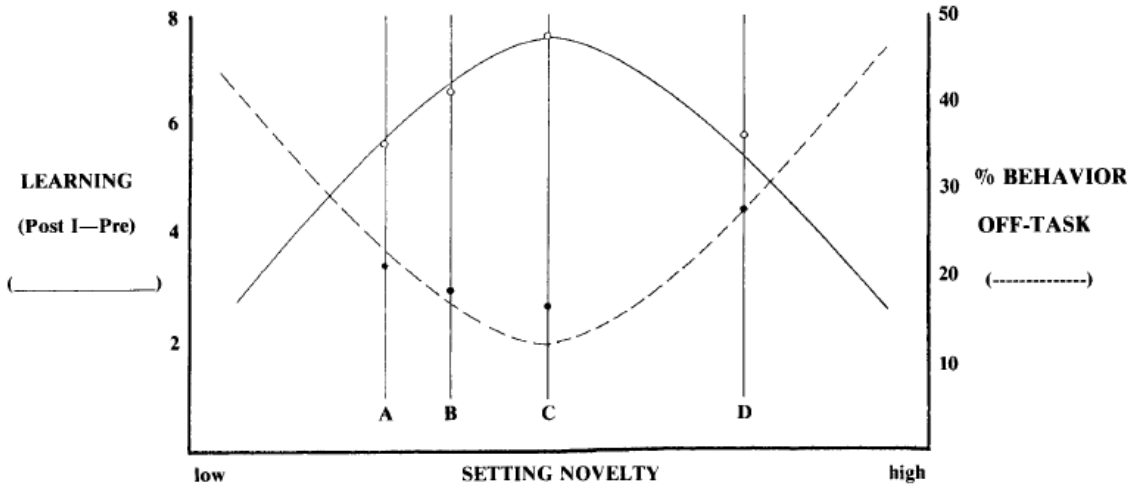

Figure 1: Model depicting learning and off-task behavior as a function of setting novelty. A= 5th grade at school, B= 3rd grade at school, C= 5th grade at nature center, D= 3rd grade at nature center (Falk & Balling, 1982, p. 27)

The Novel Field Trip Phenomenon has provided a theoretical framework for field trip models such as Orion's (1993) *Model for the Development and Implementation of Field Trips as an Integral Part of the Science Curriculum*, Storksdieck's (2006) *Integrated Experience Model*, and Morag and Tal's (2012) *Field Trips in Natural Environments (FiNE)* framework. These models for best field trip practice are outlined below.

Model for the Development and Implementation of Field Trips as an Integral Part of the Science Curriculum

This model builds off the Novel Field Trip Phenomenon discussed above by identifying three separate novelty factors which constitute "novelty space" (Orion, 1993). These three factors are cognitive, psychological, and geographical (figure 2).

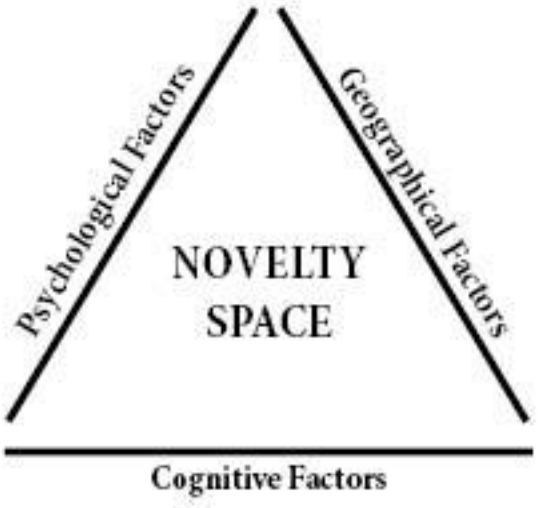

Figure 2: Factors contributing to novelty space (Orion, 1993, p. 326)

According to this model, adequate preparation can reduce all three novelty space components to a level that allows for meaningful learning on a field trip. Cognitive novelty can be reduced by concrete learning activities that work with materials students will encounter in the field or by simulating phenomena that will be encountered in the field using laboratory experiments. Geographical and psychological novelty can be reduced by showing students maps or pictures of the field trip site and by providing detailed information and explanations of what they will experience in the field (Orion, 1993).

These steps are all part of the first phase of the model for implementing field trips as an integral part of the science curriculum (Figure 3). This first phase, called the preparatory unit, is designed to decrease the novelty space factors to allow for a more productive field trip. The next phase of the model is the field trip itself. According to Orion's model, the main instructional strategy of the field trip should be experiential learning. During the field trip, students should be guided toward a process-oriented approach that focuses on touching, observing, identifying, measuring, and comparing (Orion, 1993). According to Orion (1993) the main goal of the field trip is to provide direct experiences with concrete phenomenon and materials. He bases this reasoning on the cognitive theories of Ausubel and Piaget, both of whom emphasize the role of concrete, hands-on experiences as a transitional learning stage from primary concepts to more abstract conceptual learning. The final phase of the model is the summary unit, which Orion describes as the "heavy" part of the curriculum. This stage of the learning process should introduce more complex concepts which build off the primary ones introduced in the preparatory unit and experienced in the field trip unit (Figure 3).

As shown in Figure 3, the model consists of three distinct units which move from concrete experiences to abstract levels of learning. Each phase is an independent learning unit, but also serves as a building block for the next unit (Orion 1993).

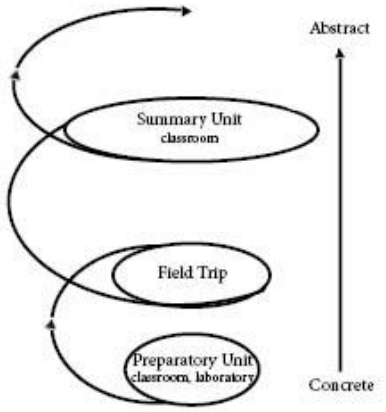

Figure 3: Model for the Development and Implementation of Field Trips as an Integral Part of the Science Curriculum (Orion, 1993, p. 329)

This model emphasizes the importance of implementing the field trip as an integral part of the formal curriculum. If field trips occur as isolated experience, the value of a field trip as a learning experience might be lost. Field trips provide students with the opportunity to construct knowledge from their environment through direct experiences and these direct experiences facilitate the transition from primary concepts to more abstract ones. However, for this to occur the field trip must be preceded by a preparatory unit to decrease the novelty space, and follow-up activities and lessons must take place to complete the learning cycle as shown in the model above (Orion, 1993).

The Integrated Experience Model- a framework for field trip planning

This model, proposed by Storksdieck (2006) and developed through observations of how audiences responded to two multimedia presentations on global environmental change at a planetarium, provides a framework for analyzing and systematizing the factors that are thought to influence field trip learning outcomes. The author found that students' prior environmental attitudes, knowledge, interest, and expectations had as much of an influence on the learning outcomes of an environmental education-focused

field trip as the experience itself. These findings, that "learners do not enter a learning situation as empty vessels; [but instead] bring into the learning situation a host of 'pre-conditions' that strongly influence their learning outcomes" (Storksdieck, 2006, p. 146) lends support to the Constructivist theory of learning and have important implications for how to conduct field trips in ways that maximize students learning.

As addressed above, the most important factor that influences learning is what the learner already knows (Ausubel, 1968). Storksdieck (2006) discusses the role of "mental models" and how these influence student learning. Mental models are the way knowledge is constructed in a person's mind and are difficult to alter once formed (Storksdieck, 2006). "Knowledge construction, in other words, is conservative. It strives to uphold the status quo. In general, we are reluctant to challenge our fundamental understanding" (Storksdieck, 2006, p. 12). This idea supports the Novel Field Trip Phenomenon and the model put forward by Orion (1993), which both address the need to reduce novelty space prior to the experience and the importance of relating the field trip to concepts students have already been exposed to in school. The Integrated Experience Model reflects Orion's (1993) model of the field trip as an integral part of the curriculum in that it divides the field trip into three distinct phases: the pre-trip phase, the field trip, and the post-trip phase (Figure 4).

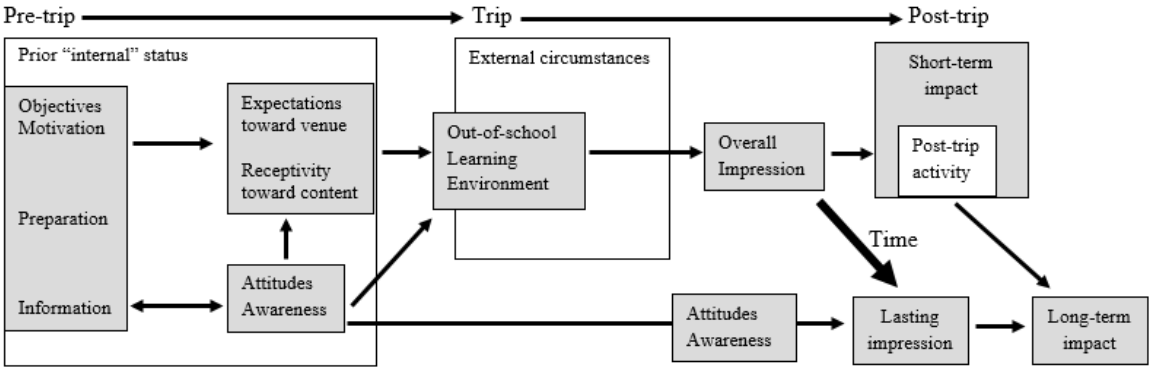

Figure 4: Integrated Experience Model (Storksdieck, 2006, p. 28)

In the pre-trip phase, students' prior attitudes, knowledge, and expectations for the field trip need to be assessed to determine what kind and how much preparation is necessary (Storksdieck, 2006). Prior knowledge and attitudes of the students should not only guide what kind of preparation occurs, but should also be considered when structuring the learning experience in order to increase student receptivity towards the content. Expectations for the field trip also need to be evaluated because "students have strong expectations, and when those expectations are not met, disappointment and anxiety might prevent learning and appreciation" (Storksdieck, 2006, p. 131). These expectations can be formed by prior knowledge and information they have received about the setting, increasing the importance of preparing students for the experience to align their expectations with what they will experience (Storksdieck, 2006).

The trip phase of this model is defined by the interplay of the out-of-school learning environment (the field trip) and the external circumstances and contextual aspects of the students; the latter influences the impact of the former. The post-trip phase of the model addresses how post-trip (follow-up) activities affect the short- and long-term impact of a field trip. In addition to students' prior knowledge, attitudes, and expectations of the field trip, another factor the Integrated Experience Model includes as

an important influence on field trip learning outcomes is subsequent reinforcing experiences.

The post-trip phase of this model is influenced by one key factor, the type of follow-up, or "subsequent reinforcing experiences" (p. 139) that are performed. According to Storksdieck (2006),

> Subsequent reinforcing experiences can reinforce any cognitive and affective gains of the visit, and hence contribute to the potential long-term impact of changes in attitude, knowledge, and emotions. Without post-trip activities or subsequent reinforcing experiences, the short-term impact will likely wither fast, leaving students with fading and rather unspecific long-term memories, and little impact on their general impression of the setting and the subject. Educationally speaking, the visit will have been for naught (p. 123).

This model, in conjunction with the model proposed by Orion (1993) above, provide further support for purposeful reinforcement of the field trip experience in order to enhance its educational value. Later in this literature review, empirical evidence will be discussed which implies that memories of a field trip are related to the degree of integration between the field trip content and formal curriculum (Anderson, Lucas, & Ginns, 2000; Farmer & Wott, 1995; Orion & Hofstein, 1994).

The Field Trips in Natural Environments (FiNE) Framework

The Field Trips in Natural Environments (FiNE) framework was developed by Morag and Tal (2012) as an instrument to systematically analyze the phases of a field trip, which they identify as preparation, pedagogy, activity, and outcomes. This framework is based on research literature plus the data collected through observations and student interviews from 22 field trips to nature parks in Israel.

The FiNE framework is presented as three rings around an inner circle (Figure 5).

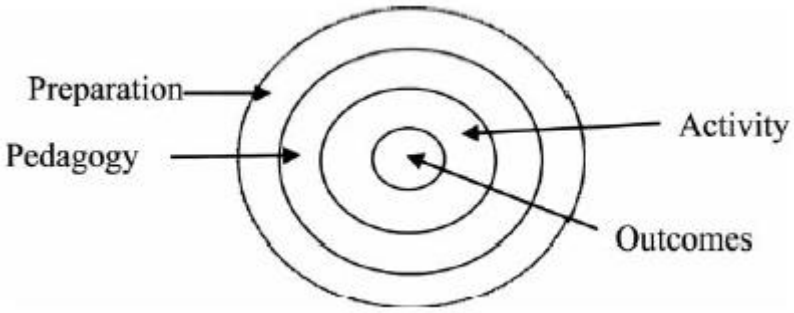

Figure 5: FiNE Framework (Morag & Tal, 2012, p. 753)

The outer ring, preparation, has three components: connection to curriculum, classroom preparation, and communication. Connection to curriculum refers to how the field trip content is related and integrated into the school curriculum, classroom preparation can be done by the teacher or the field trip facilitator, and refers to that between the field trip organization and the teacher (Morag & Tal, 2012). The components of this outer ring are shown in Figure 6.

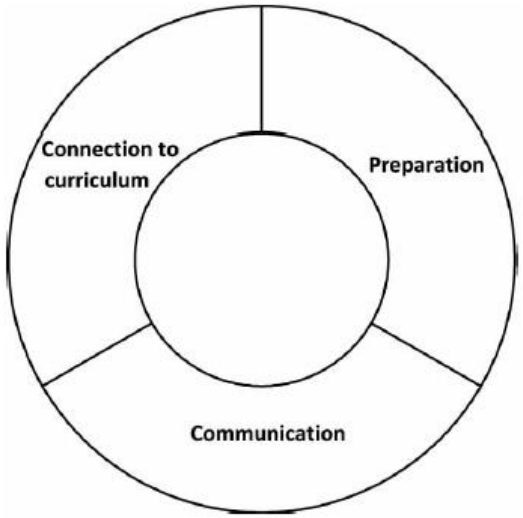

Figure 6: Components of preparation phase of FiNE model (Morag & Tal, 2012, p. 753)

The middle ring represents the pedagogy of the field trip and is broken into five components: the facilitator's performance, clarifying goals, using the environment, connecting to everyday, and social interactions (Figure 7). The facilitator's performance

is assessed by their interpersonal, didactic, and logistic skills, clarifying goals refers to the degree to which the students are familiar with the field trip goals, the using the environment component means the natural surroundings are used as a source of learning, connecting to everyday measures how the field trip content is relatable to the students' lives, and social interactions is included as a pedagogical component since this is seen to enhance learning (Morag & Tal, 2012).

Figure 7: The pedagogy phase of the FiNE model (Morag & Tal, 2012, p. 754)

The inner activity ring includes both learning and physical activities. This ring is divided into four sections, the students' perspectives on learning and physical activities and the researcher's observations of learning and physical activities (Figure 8). The ring is split in this way because to account for both the students' impressions of the learning and physical activities on a field trip, and the researchers' observations of the learning and physical activities incorporated into the field trips.

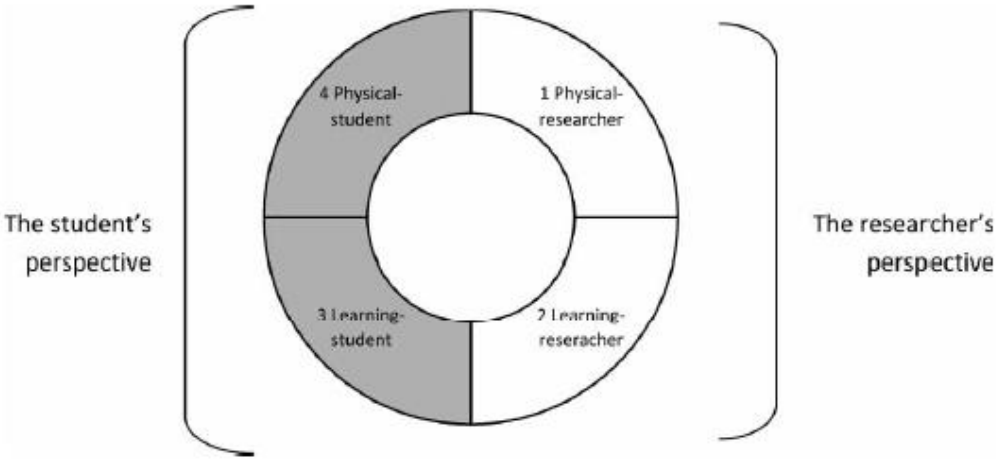

Figure 8: The activity phase of the FiNE Model (Morag & Tal, 2012, p. 754)

The inner circle of this framework represents the outcomes of a field trip, both cognitive and affective. The cognitive domain is presented as knowledge and understanding, and the affective domain is presented as feelings, attitudes, and beliefs (Figure 9).

Figure 9: The outcome phase of the FiNE model (Morag & Tal, 2012, p. 755)

The FiNE Framework outlines a scoring rubric for each phase of the field trip as a means for teachers and field trip facilitators to assess the various components of a field trip (Tables 1, 2, 3, and 4). These rubrics are an important contribution to field trip literature because they provide a tangible tool for teachers and field trip facilitators to use when planning and carrying out a field trip in a natural environment. The strength of this framework is underscored by the empirical data and research literature which guided its development.

Table 1

The planning ring scoring rubric from the FiNE Model

0	1	2
Planning		
No preparation other than collecting a parent's permission slip and providing technical information (scheduling, what to bring, etc.)	Partial preparation. The teacher roughly described the FT* destination and provided technical information	Thorough preparation. The teacher provided background information, described the FT programme, and discussed expectations for learning and behaviour
Collaboration/communication		
The organization was solely responsible for the event. No connection was made with the teacher prior to the FT	Partial collaboration. A telephone conversation took place the day/night before the FT. Commonly the facilitator informed the teacher about his/her plans and the teacher asked general questions or checked technicalities	Full partnership. A telephone conversation well in advance of the trip allowed in-depth preparation by both sides. Details about the students' needs, the curriculum and the teacher's preferences were discussed
Connection to the curriculum		
No connection	Implicit connection. Topics may be occasionally connected but the facilitator is not aware of and/or does not point out these connections	Explicit connections are made during the FT

**Field trip is abbreviated (FT) in this table and those that follow.*

(Morag & Tal, 2012, p. 758)

Table 2

The pedagogy ring scoring rubric from the FiNE Model

0	1	2
Discussing/presenting the goals of the FT		
No goals were discussed explicitly, and it was impossible to identify implicit goals	No goals were discussed, but implicit goals could be detected	The facilitator referred explicitly to specific goals that he/she and the teacher discussed prior to the FT
Addressing the environment		
	Superficial. Prepared explanations given at specific sites	In addition to prepared explanations, the facilitator offers meaningful spontaneous discussions of objects that the students find
Connection to everyday life		
No connection is made	Few or superficial connections made	Many and meaningful connections made
Social interactions		
No interactions enhanced by the facilitator	The facilitator runs games and quizzes; these yield some interaction among students and, primarily, facilitator-student interaction	Planned tasks in small groups yielding meaningful and strong collaborations
Facilitator's function		
Interpersonal skills: impatient, does not treat students equally, does not show empathy. Didactic skills: uses few demonstrations, shows little enthusiasm, uses language/terms which are not understood. Logistic skills: poor pacing, breaks too long or too short, makes the students hurry, does not complete the programme	Inconsistent performance in all three areas, or poor performance in one or two areas	Interpersonal skills: shows patience and empathy, treats all students equally. Didactic skills: uses appropriate language and explains difficult terms, shows enthusiasm, shares stories and experiences, uses demonstrations. If he/she already knows the students, uses this knowledge to enhance learning. Logistic skills: good pacing and balance

(Morag & Tal, 2012, p. 760)

Table 3

The activity ring scoring rubric from the FiNE Model

0	1	2
Physical activity — the researcher's view		
No physical activity other than walking along the trail	The trail incorporates physical activities such as climbing, jumping, or crawling	The facilitator promotes physical experiences and encourages the students to do things that activate their senses and feelings
Learning activity — the researcher's view		
None. "Walk and talk" pattern	Demonstration or quiz. The facilitator demonstrates phenomena with the help of a student or two. All the others observe and listen	Small group or individual games or assignments that promote exploration and active learning (e.g., asking students to find and collect specific items)
Physical activity — the student's view		
No activity.	Minor physical activity. "We got into a cave that had many holes. I did not get into any. I took the shortest way out." (L', T-1106-6)	Significant physical activity which is connected to new knowledge, feelings or social interaction. "The stream was an attraction. We got into the water, which was a surprise. It was fun. We got wet and happy. Being free in the water was a nice surprise, we could calm down." (G-0508-6)
Learning activity — the student's view		
No activity	Minor learning activity "Each one got a task, a concept that was there, which we had to find and explain. I and my friend had to find a canal and explain about it." (G', Y-0507-5)	Significant learning activity which is connected to new knowledge, feelings or social interaction "We had to uncover a secret code. We got a key and that's how we decoded this letter. We worked in teams and each one did something. I wrote, and someone else told me the next letter. It's fun when everyone works and together we got a result." (Y', N-0307-6)

(Morag & Tal, 2012, p. 764)

Table 4

The Outcome ring scoring rubric from the FiNE Model

0	1	2	3
None.	Statement is incorrect, incomplete or simplistic "Oak trees provide air." (A', K-0307-5)	Statement draws simple but accurate connections between cause and effect "Everywhere on that hill, if you dig you can find an ancient mosaic and other things as well. This is how they found the synagogue floor." (L', T-1106-6)	Statement addresses in detail a scientific process, points to cause-effect relationships, and adds examples "I understood that porcupines are hunted although it's forbidden since they are endangered. If they go extinct the whole food web will be harmed because then leopards will not have food and other animals as well. Eventually it will harm us. Once, my dog found a porcupine and began barking, so I took it away and let the porcupine go away." (E', Z-0509-4)

(Morag & Tal, 2012, p. 765)

The FiNE framework presents field trips as multifaceted experiences and provides a way to assess the field trip experience in a holistic fashion. This framework is grounded in the Constructivist Theory of learning, as evident by its emphasis on the importance of connectedness to students' everyday lives, direct experiences with the environment, and active learning opportunities. The FiNE framework also provides additional evidence of the importance of preparation and follow-up when conducting field trips.

The following section will outline examples of research literature that provide empirical support for the educational benefits that can be gained when preparation and follow-up are included in the field trip experience.

Empirical Evidence for the Benefits of Preparation and Follow-up

Orion and Hofstein (1994) found that the learning performance of students was largely controlled by the degree to which the novelty space had been reduced prior to the field trip. The field trip used in this study was part of a high school geology class in Israel. The subjects of the study were given varying levels of preparation prior to the experience, determined by the degree to which the novelty space had been reduced prior to the field trip. Optimal preparation included reduction of all three novelty space factors: cognitive, psychological, and geographical. Cognitive preparation included hands-on activities, psychological preparation involved detailed descriptions of the event, and geographical preparation consisted of slides, maps, and a video (Orion & Hofstein, 1994). Results were consisted with the model proposed by Orion (1993) which emphasizes the importance in reducing the novelty space prior to a field trip in order to maximize its educational potential.

A case study conducted by Anderson, Ginns, and Lucas (2000) focused on the influence of post-visit activities following a school visit to a science museum on subsequent learning and knowledge construction in 11- and 12-year-old students. Twelve students were selected from a class of 28 at a primary school in Brisbane, Australia to participate in interviews prior to the science museum field trip, immediately after, and a third time after they had participated in follow-up activities. Before the visit and immediately after students constructed concepts maps about electricity and magnetism, the selected topic of the field trip to the science museum. One week after the field trip, students participated in two follow-up activities. For the first activity, they were tasked with describing how two of the exhibits they encountered during the field worked, and for the second activity they conducted experiments which reflected the content of the

exhibits at the science museum. After these follow-up activities, students drew a third and final concept map.

Analysis of the concept maps found that knowledge construction about electricity and magnetism was facilitated by both the field trip and the follow-up activities. The findings of this case study address an additional benefit of follow-up activities, namely the importance of addressing any misconceptions that may have arisen or been reinforced during the field trip. Anderson et al. (2000) found that the field trips and follow-up activities

> …transformed knowledge in both *correct* and alternative ways, despite the best intentions of exhibit designers and the planners of the post-visit activities to provide experiences that would help facilitate knowledge construction in ways consistent with the accepted view of science. This point underscores for teachers, and staff of science museums and similar centers, the importance of planning pre- and post-visit activities not only to support the development of scientific conceptions, but also to detect and respond to alternative conceptions that may be produced or strengthened during a visit to an informal learning center. (p. 678)

A study conducted by Farmer and Wott (1995) also found that follow-up activities reinforced concepts presented during a field trip. The study followed a pretest-posttest control group design. The subjects of this study were 111 fourth-grade students from the same school in Seattle who participated in the same field trip to an arboretum. All students were given a pretest designed to measure their understanding of the content of the field trip. The students were randomly assigned to a treatment group or a control group where the treatment group participated in follow-up activities relevant to the field trip content and the control group received an informative but not relevant follow-up

activity. The posttest scores indicate that relevant follow-up activities help reinforce concepts encountered on a field trip (Farmer & Wott, 1995). All these studies provide support for the models introduced above and they highlight the role of preparation and follow-up activities as integral parts of a field trip experience.

The three models for field trips outlined earlier in this review also stress the importance of curricular connectedness between a field trip and the formal classroom. According to these models, the educational benefits of a field trip can be lost if they are isolated experiences and not integrated into the formal curriculum. In addition, many studies have shown that when teachers are asked about their motivations for conducting field trips, connectedness to curriculum is often cited as the primary reason for and benefit of such excursions (Anderson, Kisiel, & Storksdieck, 2006; Anderson & Zhang, 2003; DeWitt & Osborne, 2007; Eshach, 2007; Kisiel, 2005). However, as the following section reveals, there are often "disparities between pedagogical beliefs and field-trip practice" (Anderson & Zang, 2003, p. 9).

Disparities between Pedagogical Beliefs and Field Trip Practice

"Pedagogically speaking, there is little doubt that it is good practice to capitalize on the richness of students' field-trip experience in the classroom and in the contexts of the school-based curriculum they encounter" (Anderson & Zang, 2003, p.9). This supports the models presented above, which all stress the importance of integrating the field trip experience into the formal classroom. Many studies also highlight teachers' beliefs of the pedagogical benefits of such integration (Anderson & Zhang, 2003; Carrier, 2009; DeWitt & Storksdieck, 2008; Kisiel, 2005). Anderson and Zang (2003) found that the primary factor teachers in Vancouver, Canada considered when planning and implementing a field trip to museums is how the experience relates to the formal

curriculum. A descriptive study of teachers in the Los Angeles, CA area investigated teachers' field trip agendas. Survey results showed that 90% of responding teachers considered connectedness to classroom curriculum as the primary motivation for conducting field trips (Kisiel, 2005). However, despite these reported motivations and agendas, both studies and many others indicate that there are disparities between teacher intentions for and practices during field trips (Anderson et al., 2006; Anderson & Zhang, 2003; DeWitt & Osborne, 2007; Eshach, 2007; Kisiel, 2005).

For example, the importance of curricular integration was not reflected in teachers' "self-reported pedagogical approaches to field trip implementation, nor in the ways they later integrated the experience within their classroom curriculum" (Anderson & Zang, 2003, p. 9). While curriculum fit was ranked by teachers as the main consideration when planning and implementing a field trip, only 22% of teachers viewed curricular fit as a factor influencing the success of a field trip. Kisiel (2005) found similar discrepancies. While 90% of teachers considered connectedness to classroom curriculum as a motivation for conducting field trips, only 23% of respondents from the same study identified connections to classroom curriculum as an indicator of a successful field trip.

This paradox is often attributed to the fact that connection to curriculum is often a requirement or qualification for a field trip (Anderson et al., 2006; Coughlin, 2010; DeWitt & Storksdieck, 2008; Kisiel, 2005) and "a reflection of curriculum prioritization at an [administrative] level above the teacher" (Anderson et al., 2006, p. 371). Teachers in many studies, especially in the United States, referred to an atmosphere of accountability which puts pressure on them to justify how field trips are connected with

formal instructional requirements and supports mandated curriculum (Anderson et al., 2006b; DeWitt & Storksdieck, 2008; Kisiel, 2005).

> Field trips are coming again under attack and are faced with the need to prove their worth. Field trips are increasingly threatened by limited school funding, lack of time and crammed curricula, the pressures of standardized tests and student assessments, and a need for teachers and principals to document whether and in what way individual field trips satisfy curricular demands. (DeWitt & Storksdieck, 2008, p. 182)

These statistics are not meant to imply that teachers only put value on connecting field trip experiences with formal curriculum because they are expected to. Rather, they seek to highlight the reality that teachers face many obstacles when planning a field trip (Anderson et al., 2006). The pressure to meet school and district expectations of field trips is only one of many barriers which prevent teachers' pedagogical beliefs of field trips from matching their practice. The following section of the literature outlines these additional barriers and how they contribute to the prevention of adequate field trip curricular integration, preparation and follow-up.

Barriers to Field Trip Curricular Integration, Preparation, and Follow-up

Time constraints are a prominent barrier to conducting preparation and follow-up activities before and after a field trip. Teachers are inhibited by an already overcrowded curriculum and standardized testing or test preparation (Anderson et al., 2006; Griffin, 2004; Kisiel, 2005; Rickinson et al., 2004). The timing of a field trip within the school year can also be a barrier to curricular integration, preparation, and follow-up. In the Anderson et al. (2006) study, one teacher remarked during an interview that "testing pushed the field trip to the very end of the year when the teacher was unable to make the

sorts of useful curriculum connections that she would have liked" (p. 371). The timing of a field trip determines how it can be used, the degree to which it can be incorporated into the formal curriculum, and the amount of preparation and follow-up that is possible (Anderson et al., 2006; Kisiel, 2005). This supports the Orion (1993) model of field trip integration discussed earlier in the literature review. To review, this model stresses the importance of conducting a field trip after a short preparatory unit and following it with the introduction of more complex concepts which build off the primary ones introduced in the preparatory unit and experienced during the field trip. Unfortunately, field trips are often assigned dates by administration, the timing of which does not always allow for making connections to the formal curriculum (Kisiel, 2005).

Another barrier which contributes to adequate curricular integration and field trip preparation and follow-up is the inherent disconnect that exists between formal and non-formal and informal learning environments (Tal et al., 2014). Teachers may not be aware of the field trip content that will be encountered in the non-formal or informal setting and field trip practitioners are not always attuned to the prior knowledge and experience students bring with them to a field trip (Anderson et al., 2006b; DeWitt & Storksdieck, 2008). This disconnect can affect how well the field trip experience relates to formal curriculum and can have important implications for the effectiveness of preparatory activities. Many studies also found that teachers were unclear as to their role in field trips and who was responsible for providing preparation and follow-up activities (Anderson & Zhang, 2003; Griffin & Symington, 1998; Kisiel, 2005, 2013). Anderson and Zang (2003) found that one third of participating teachers felt that museums were responsible for providing post-visit activities. Anderson et al., (2006) address the need for informal and non-formal learning sites to provide accessible materials to teachers which support

field trips and connect them to the formal curriculum. Kisiel (2005) also provides a perspective on how this disconnect can be mitigated.

> Clearly, supporting teacher agendas requires an understanding of teacher and school contexts. As teacher choices and subsequent fieldtrip agendas are being limited by other circumstances, especially circumstances within the school context, it is necessary for museums to be aware of these factors. Similarly, teachers must recognize how their agenda fits with the institution they are visiting. This increased awareness on both sides of the fieldtrip may help reduce some of the conflicts inherent in this juxtaposition of formal and informal settings. (p. 952)

Another barrier to field trip curricular integration, preparation, and follow-up is that teachers do not always receive formal training in field trip pedagogy or are not aware of recommended field trip practices (Carrier, 2009; DeWitt & Storksdieck, 2008; Kisiel, 2013; Rebar, 2012; Tal, 2001). Many studies have stressed the importance of providing pre- and in-service teachers with resources and training that will increase their field trip pedagogical knowledge (Carrier, 2009; Kisiel, 2013; Rebar, 2012; Tal, 2001). Kisiel (2013) looked at the effect of one such per-service training. Pre-service training for aspiring teachers in northern California requires a Community-Based Learning Assignment where pre-service teachers go to informal science education institutions to promote awareness and use of these resources. The results of this study revealed that these experiences increased pre-service teachers' pedagogical knowledge of informal learning centers and understanding of how such institutions can support formal and supplement formal instruction (Coughlin, 2010).

One factor, which is not a barrier per se, but does have important implications for research on field trip practices, is that there are many interpretations and degrees of curricular connection (Anderson et al., 2006; Eshach, 2007; Kisiel, 2005; Leatherbury, 2011).

> Interview and observation data suggested that the level of connection between a field trip and the curriculum covered a range: from a fully integrated field trip, complete with pre- and post-visit activities that built on the experience and corresponded to state science standards; to a casual sense of implicit connection that teachers believed would be obvious to students without much discussion back at the classroom. (Anderson et al., 2006, p. 370)

The same has been found to be true for preparation and follow-up activities. In a case study conducted by Leatherbury (2011) which explored how teachers visiting the Central Wisconsin Environmental Station utilize pre-and post- field trip activities, preparation covered three general topics: educational, logistical, and behavioral. For educational preparation, vocabulary and concepts were introduced; for logistical preparation students were informed of the packing list and schedule; and behavioral preparation included going over expectations for good behavior and participation. In the same study, follow-up activities reported by teachers ranged from a class discussions and review of vocabulary to having their students write in a journal about their experience and prepare projects related to the field trip.

In other studies, curricular integration of field trip content was limited to informal, opportunistic connections and not incorporated into the formal curriculum in an intentional and structured way (Anderson et al., 2006; Storksdieck, 2006; Tal, Bamberger, & Morag, 2005; Tal et al., 2014). Kisiel (2005) found that some teachers

considered curricular connections to be a "natural outgrowth" (p. 946) of field trip experience and explicit connections were not needed for students to be able to relate the field trip to formal classroom content and for their future work to be enriched by the experience. Teachers from this study also commented that other curricular obligations prevented them from taking the time to conduct explicit follow-up activities.

Despite the numerous barriers to field trip curricular integration, preparation, and follow-up, the final section of this literature review will discuss two studies which model exemplary field trip practices.

Exemplary Field Trip Practices

Coughlin (2010) outlines the efforts of a historical society, university professor, and a local school district in Pennsylvania to develop an integrative field trip experience for third graders. These partners developed pre- and post-visit lessons for this field trip, and teacher questionnaires showed that the field trip content was effectively integrated into the formal curriculum and Pennsylvania Academic Standards. The designated lessons for before, during, and after the field trip were rooted in constructivist theories of learning through an emphasis on interactive activities, student engagement, and active participation. Pre-visit lessons built background knowledge and focused student learning for field trips, and follow-up activities also allowed for student reflection and assessment of student learning (Coughlin, 2010). This collaborative effort is a prime example of effective field trip practice.

Through implementation of the FiNE framework introduced earlier in this literature review, Tal et al. (2014) analyzed 62 field trips to natural environments in Israel and identified the five which scored highest in the FiNE framework. These five field trips were exemplary in many areas, but not all of the following domains which the FiNE

framework qualifies as components of a well-executed field trip were shown: good preparation in school, collaboration between guides and teachers, active learning, proper, and frequent use of objects in the environment, and making connections to the school curriculum and the students' own life experiences (Tal et al., 2014). Based on their finding, the authors of this study propose a few design principles for field trips in natural environments (Tal et al., 2014, p. 457):

- Field trips should be planned together by the teachers and the field guide who need to discuss their goals, means and collaboration pattern
- Field trips should be planned with knowledge of and connection to the school curriculum, in order to make ideas visual and concrete
- The teacher should be involved throughout the field trip, as a mediator in the cognitive and in the social domains
- The guide should make use of the environment in various ways, including building on students' discoveries and their attention
- Students should learn from interactions with objects in the environment and from interactions with each other
- Field trips should be based on student-centered learning activity, in which students explore and investigate the environment hands on, share findings and thoughts and discuss things
- Field trips should include "amplified" physical experience, adventure activities, and opportunities to directly experience the unique features of the outdoors.

These recommendations follow the FiNE framework and the other field trip models discussed earlier, and they support the learning theories of Brain Based Learning and Constructivism. Such examples of exemplary field trip practices are important tools for

both teachers and field trip providers, and they demonstrate ways to overcome many of the barriers discussed above.

Summary

This section summarizes the Literature Review for this study. The order of the bullet points corresponds to the order in which the topics were introduced within this Chapter.

- Field trips provide important educational benefits.
- Field trips for environmental educational purposes increase environmental literacy and result in more positive attitudes towards the environment.
- Holistic experiences that engage the cognitive, affective, and kinesthetic domains strengthen memory and learning.
- Learners construct knowledge from experiences.
- Learning occurs when new concepts can be related to existing ones.
- Novelty increases motivation to learn.
- People are more likely to be unable to focus on structured learning tasks in novel situations.
- Preparation for and follow-up of field trips increases student learning of concepts addressed by the field trip
- Teachers face many barriers to curricular integration of field trips.

Chapter Three

Methodology

Introduction

The purpose of this study was to describe the preparation and follow-up teachers conducted before and after an extended fieldtrip to a residential environmental learning center (RELC) as a means of connecting these field trips to formal curricula, and the factors that influenced these decisions. The research questions that guided this study are:

1. How do teachers connect outdoor learning experiences at RELCs with the formal classroom curriculum through preparation and follow-up activities?
2. How do RELCs support the integration of the field trip into formal education?
3. What do teachers perceive as being needed to better support curricular integration and their preparation and follow-up efforts for an extended field trip to an RELC?

This study is significant because research on this topic has been more focused on single-day field trips to museums, zoos, aquarium, nature centers, etc., with few addressing extended field trips to RELCs. The present study surveyed teachers who participate in environmental education programs at Minnesota's RELCs with the purpose of providing a more comprehensive understanding of how Minnesota teachers integrate environmental education experiences at RELCs with formal curriculum. The design of this study is survey research and quantitative data was collected electronically. This methodology provides a numerical description of trends in a population through statistical analysis of a sample of that population (Creswell, 2009). Quantitative data also provides a nomothetic explanation (Babbie, 2011) and the purpose of this research is to describe how teachers in Minnesota commonly prepare and follow-up trips to RELCs and does not seek an in-depth understanding of a single case.

Design

The design of this study was survey research. The purpose of survey research was to sample a population in order to draw conclusions about the larger population the sample represents (Creswell, 2009). Two populations were sampled and a survey instrument was designed for each. Both instruments were cross-sectional electronic questionnaires which collected quantitative data. The electronic questionnaires were developed through Baseline, a product of CampusLabs, LLC. The two populations were program/education directors at RELCs in Minnesota and Minnesota teachers who attended extended field trips with their students to an RELC. The questionnaire for RELC program/education directors (Appendix A) and the questionnaire for the teachers (Appendix B) were distributed per the methods described below.

Population and Sample

The populations for the study were the education/program directors (the personnel who have direct contact with teachers in the scheduling and/or the preparation and follow-up phase of a field trip) of Minnesota RELCs that provide residential environmental education programming to the students of the selected teachers, and Minnesota teachers who have attended extended field trips with their students to a Minnesota RELC. The sampling frame for the RELCs in MN came from the Sharing Environmental Education Knowledge (SEEK) database (SEEK, 2014) and sampling was done through random selection. Using excel, the 11 RELCs in Minnesota were randomly sort. Then, the education/program directors of the first four RELCs on the list were contacted and were invited to participate in the study. Of these initial four, one declined to participate, so the next RELC education/program director on the list was contacted and did agree to participate. This yielded a sample population of four for the RELCs. All four

participating RELCs signed a letter of support (Appendix C) for this study. Once the four RELCs were selected and the signed letters of support were returned, the education/program director who has direct contact with teachers in the scheduling and/or the preparation and follow-up phase a field trips completed the survey instrument designed for the RELC.

The sampling frame for the teacher population was all teachers from the schools who attend one of the four randomly selected RELCs. The sample was selected through nested random sampling. First, each participating RELC provided the researcher with a list of the schools who currently participate in their residential programming. The schools from each of the four lists were randomly sorted and the first 15 on each list were selected. Next, the education/program directors sent their primary contact teacher for each of the 15 schools on their respective list an introductory email (Appendix D). This email introduced the researcher and purpose of the study, and the primary contact teachers were asked to respond with the email addresses of the other teachers at their school who had participated in residential programming at the RELC who contacted them for this study. Within each set of 15 schools (one set for each of the four participating RELCs), if the number of teacher emails collected by the introductory email was less than 30, an additional school on the list was contacted until the number of teachers included for each RELC was equal to or greater than 30. The four lists were then combined and yielded a sample population of 140.

Instrumentation

Two self-developed survey instruments in the form of electronic questionnaires were developed through Baseline, a product of CampusLabs, LLC- one for the participating program/education directors and one for the participating teachers. Each

instrument included a Consent Form which explained that participation was voluntary, all results were anonymous, the purpose of the study, and the estimated time to complete the questionnaire. The Consent Form also explained that continuing from the consent page was an acknowledgement of participation. The teacher questionnaire was adapted from Whittier (2000) and Leatherbury (2011). Each instrument included a combination of demographic information (e.g. Do you teach at a public, private, or charter school?), yes/no (e.g. Did you serve as the primary contact teacher for the field trip during your most recent visit to the RELC?) single- and multiple-select (e.g. How did you acquire materials from the RELC?), and Likert scale questions (e.g. Please indicate the level to which you agree with the following statement.). Each question also allowed participants to skip the question or select "other, please comment below." Comment boxes were provided for respondents to elaborate on their selection of "other, please comment below" but additional comments where not required to proceed to the next question. The teacher questionnaire was designed to measure:

- The types, if any, of preparation and follow-up teachers conduct before and after extended field trips to RELCs
- Whether or not these efforts support formal curriculum and state standards
- The reasons why teachers do or do not conduct preparation and follow-up
- What teachers see as being needed to enhance their ability to prepare and follow-up an RELC experience
- Demographic variables, such as grade taught and type of school (public vs. private)
- Information about their history of participation in field trips to RELCs.

The RELC questionnaire was designed to measure:

- The types of resources RELCs provide to teachers that support preparation and follow-up
- How these resources are accessed by teachers
- To what extent these resources support formal curriculum and Minnesota academic state standards

A panel of three experts examined the survey instrument for face, content, and criteria validity. The panel was composed of individuals with expertise in:

- Survey research
- Residential environmental learning centers
- Formal education
- Field trips

Data Collection Procedures

Data collection took place from mid-February to mid-March of 2015. A link to the electronic questionnaire designed for the RELC education/program directors was sent via email to the four participating RELCs (Appendix D), and a link to the electronic questionnaire designed for teachers was sent via email to the 140 participating teachers (Appendix E). The email sent to the RELC education/program directors sample population contained the same subject heading and body content to standardize the conditions for data collection. The same was done for the email sent to the teachers sample population. Follow-up email notifications (Appendix F) were sent to both sample populations once a week for three weeks following the initial email for a total of four email notifications.

Data Analysis

Descriptive statistics were used to analyze the data. Statistics included measures of central tendency (means), measures of spread (standard deviation), frequencies, and percentages. The additional comments provided by respondents are not included in the descriptive statistics, but are included in the Chapter 5- the Discussion section of this project. Respondents were allowed to skip any question on the questionnaire by selecting "NA." If a respondent skipped a question, they were not included in the data analysis for that question. Each question outlines how many respondents provided answers for that question. Some questions were coded so that specific answers would direct respondents past a number of questions which were no longer applicable to them because of their response to a specific question. The results in Chapter 4 outline when this occurred in the instrument and explains when and how many respondents were directed past a set of questions.

Chapter 4

Results

This chapter summarizes the results of this survey research. The purpose of this study was to describe the preparation and follow-up Minnesota teachers conducted with their students before and after an extended field trip to a residential environmental learning center. This study also describes how these teachers connected such trips to formal curriculum. In addition, the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities was determined. The research questions that guided this study are:

1. How do teachers connect outdoor learning experiences at RELCs with the formal classroom curriculum through preparation and follow-up activities?
2. How do RELCs support the integration of the field trip into formal education?
3. What do teachers perceive as being needed to better support curricular integration and their preparation and follow-up efforts for an extended field trip to an RELC?

The first section outlines the results of the questionnaire completed by the program/education program directors of the RELCs who participated in this study, and the second section outlines the results of the questionnaire completed by the teacher respondents.

RELC Questionnaire

This questionnaire was complete by the education/program directors of the four participating RELCs. The results of this questionnaire are divided into two sections: the types of preparation resources they send schools, and the types of follow-up resources they send to schools.

Preparation resources.

All four respondents (100%) indicated that their RELC provides preparation materials to teachers prior to their visit, and these materials are available even if not requested. One of the four respondents (25%) indicated that their RELC sends supporting information (i.e. information on native plants and/or animals) which supports learning at their center to teachers prior to their visit, two respondents (50%) indicated that their RELCs do not send these types of resources to teachers prior to their visit, and the final respondent (25%) selected "other" for this question. This respondent commented "we do not send the documents themselves but send them the links to the activities on our website." Two (50%) of the respondents' RELCs provide preparation lessons and activities to be conducted in the teacher's classroom prior to their visit, and these lessons and/or activities indicate which Minnesota academic state standard(s) and/or benchmark(s) they address. On a 5-point Likert scale, respondents indicated the level to which they agree their RELC's preparation materials explain how to connect the field trip content with formal classroom curriculum. Table 5 displays these results. The two respondents who chose "agree" are also the two RELCs who provide preparation lessons and activities to be conducted in the teacher's classroom prior to their visit.

Table 5

RELC preparation materials provided to visiting teachers explain how to integrate field trip content with formal classroom curriculum

	Frequency	Percent
Strongly Disagree	0	0
Disagree	2	50.0
Neither agree nor disagree	0	0
Agree	2	50.0
Strongly agree	0	0
Total	4	100.0

Follow-up resources.

Three (75%) of the responding RELCs provide follow-up materials to teachers and the fourth (25%) provides follow-up materials only upon request. One of the four respondents (25%) indicated that their RELC sends supporting information (i.e. information on native plants and/or animals) which supports learning at their center to teachers after their visit, and the other three (75%) do not. Two (50%) of the respondents' RELCs provide follow-up lessons and activities to be conducted in the teacher's classroom after their visit, and these lessons and/or activities indicate which Minnesota academic standard(s) and/or benchmark(s) they address. On a 5-point Likert scale, respondents indicated the level to which they agree their RELC's follow-up materials explain how to connect the field trip content with formal classroom curriculum. Table 6 displays these results. Two of the respondents who selected "agree" are also the two RELCs who provide preparation lessons and activities to be conducted in the teacher's classroom prior to their visit. The other respondent who selected "agree" does not provide lessons and/or activities to be conducted in the teachers' classrooms after their visit, but does provide other follow-up materials. The respondent who selected "disagree" does not provide lesson and/or activities to be conducted in the teachers' classrooms after their visit and their follow-up materials are only available upon request.

Table 6

RELC follow-up materials provided to visiting teachers explain how to integrate field trip content with formal classroom curriculum

	Frequency	Percent
Strongly Disagree	0	0
Disagree	1	25.0
Neither agree nor disagree	0	0
Agree	3	75.0
Strongly agree	0	0
Total	4	100.0

Teacher Questionnaire

The results of this questionnaire are divided into the following sections: information about respondents' teaching history and their most recent participation with their students in a multi-day field trip to the RELC that recruited them for this study, the types of preparation respondents conducted with their students prior to RELC visits, the types of barriers respondents perceived as preventing preparation before field trips to RELCs, the types of follow-up respondents conducted with their students after RELC visits, the types of barriers respondents perceived as preventing follow-up after field trips to RELCs, and the types of resources respondents obtained from the RELC before and after the field trip.

Respondent characteristics.

Of the 140 teachers who received the link to the electronic questionnaire, 70 teachers responded (N=70) for a response rate of 50%. Incomplete questionnaires were excluded from data analysis so the following results include answers from 62 respondents (n=62). Respondents were given the opportunity to skip any question on the questionnaire, so some results present data from less than 62 respondents. Other questions were also only answered by select respondents based off their answers to

specific questions. The results below will indicate which questions excluded respondents from answering based on prior response in the questionnaire.

Respondents were asked which K-12 grade (Figure 10) and which subject (Table 7) they were teaching at the time of their most recent field trip to the RELC which recruited them for this study. Each was a multi-select question for teachers who taught more than one grade or more than one subject at the time of their most recent field trip. The respondents who selected more than one grade contribute a frequency of 1 for each grade they selected, and the respondents who selected more than one subject contribute a frequency of 1 for each subject they selected.

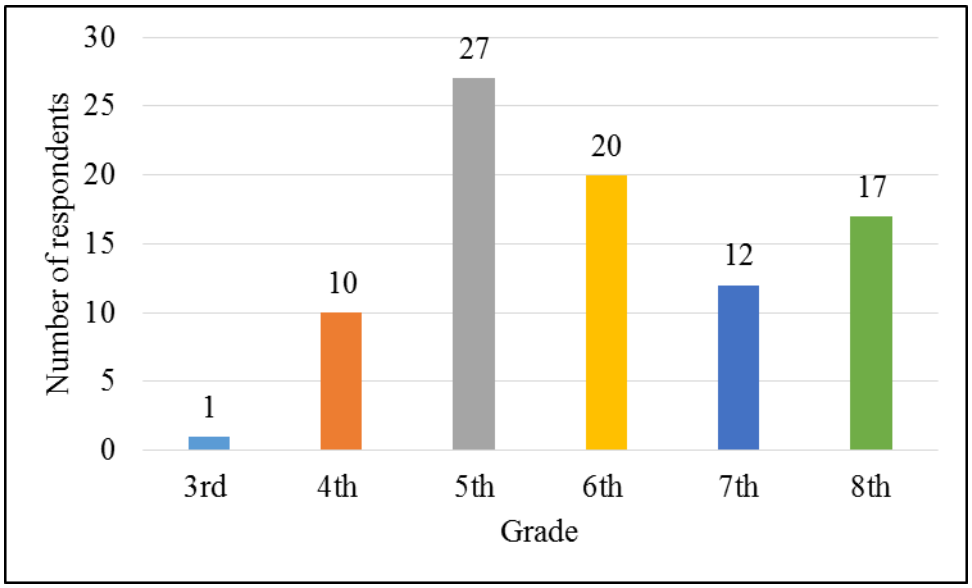

Figure 10: Grade taught at time of respondents' most recent field trip to an RELC (n=62). These data come from a multi-select question. Teachers were allowed to select more than one response. Respondents contribute a frequency of 1 for each option selected.

Table 7

Subject area taught by respondents at their school at the time of their most recent field trip to an RELC. (n=62)

Subject	Frequency
I taught all core subjects to my grade	20
Math	15
Language Arts	12
Earth and Space Science	8
Biology	7
Social Science	6
English	5
History	4
Chemistry	2
Physics	2
Art	2
Physical Education	2
Special Education	2
Life Science	1
Science	1
Simple Machines and Earth Movements	1
Wilderness Experience	1
Principal	1
Admin	1
Counseling	1

Note. These data come from a multi-select question. Teachers were allowed to select more than one response. Respondents contribute a frequency of 1 for each option selected.

Forty-seven respondents (75.8%) taught at a public school during their most recent visit to an RELC, 12 (19.4%) taught at a private school, and 3 (4.8%) taught at a charter school. Figure 11 shows for how many years respondents had been teaching. Figure 12 shows how many times respondents have accompanied their students on a field trip to an RELC. Thirty-two respondents (51.6%) served as the primary contact teacher for the field trip during their most recent to the RELC that recruited them for the study, and 36 (58.1%) have served as the primary contact teachers for a field trip to an RELC in

the past. Figures 11 and 12 demonstrate that veteran teachers are highly involved in getting their students to RELCs.

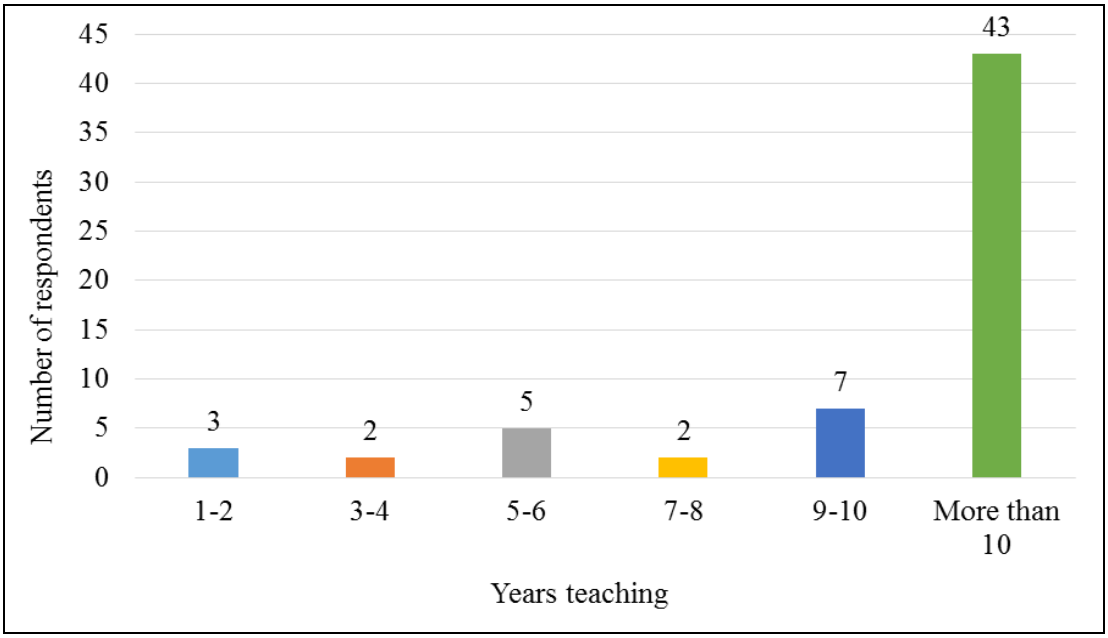

Figure 11: Number of years respondents have been teaching (n=62).

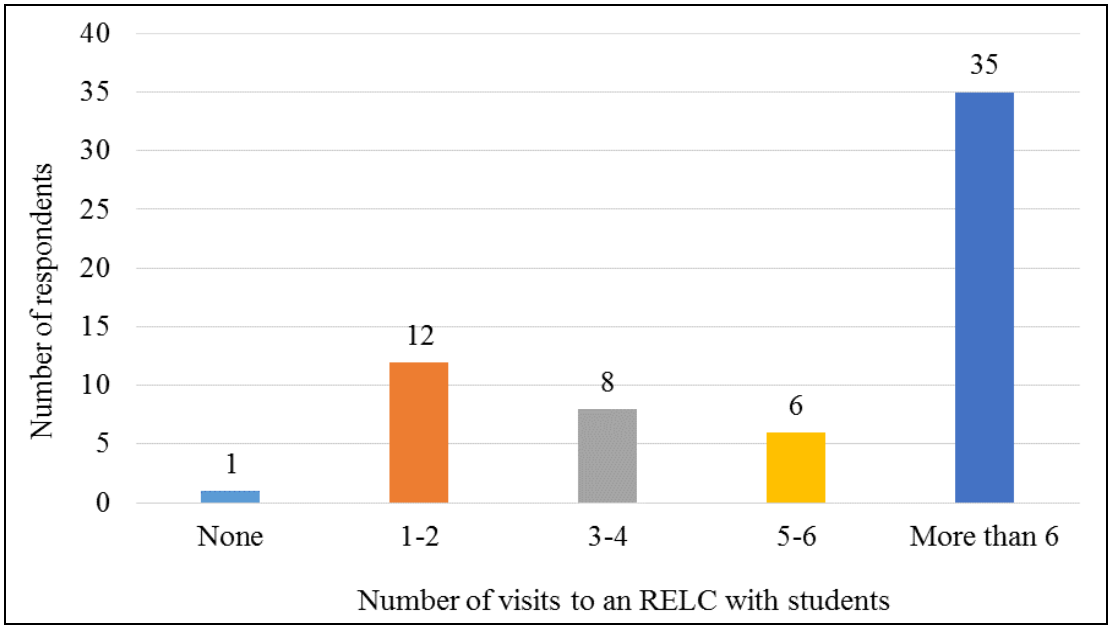

Figure 12: Number of times respondents have accompanied their students on a trip to an RELC (n=62).

Preparation.

Types of preparation.

Of the 62 teacher respondents, 55 (88.7%) indicated that they conducted some type of preparation with their students prior to the field trip focused on connecting the field trip experience with their classroom curriculum. Five (8.1%) did not conduct preparation with their students prior to the field trip, and two (3.2%) selected "other" in response to this question. One of the respondents who selected "other" commented that their school is modeled after the Montessori curriculum which is interdisciplinary in nature and field trips to RELCs often build on prior learning or inspire interest in a new topic depending on age and experience of the student. The five respondents who indicated that they did not conduct preparation with their students prior to the field trip did not answer the rest of the questions in this section but will be included in the following section of the data analysis which addresses types of perceived barriers to field trip preparation focused on curriculum integration.

The rest of this section represents data from the remaining 57 respondents (the 55 who indicated that they conducted some type of preparation with their students prior to the field trip and the two who selected other). Of these, 39 (68.4%) taught a lesson before the field trip which related the field trip content with their classroom curriculum, 17 (29.8%) did not, and one respondent skipped this question. Table 8 shows the number of lessons conducted by the 39 respondents who did teach a lesson prior to the field trip. The respondents who did not indicate that they teach a lesson prior to the field trip are not included in the table. Three of the 39 respondents to this question selected "other" and their comments revealed that the lessons they taught focused more on discussing and answering questions about the field trip and on social and communication skills.

Table 8

*Number of lessons taught **before** the field trip focused on connecting the field trip content with their formal classroom curriculum*

Number of lessons	Frequency	Percent
Less than 5	23	58.97
5 or more	9	23.08
An entire unit was dedicated to connecting the field trip content with the classroom curriculum	4	10.26
Other	3	7.69
Total	39	100.0

The respondents were also asked about the other types of preparation they conducted with their students focused on connecting the field trip content with their classroom curriculum. Respondents were asked to respond on a 6-point Likert scale from never (1) to very frequently (6) how often they conducted six different types of preparation with their students. Table 9 shows the mean and standard deviations of each type of preparation, and how many teachers responded to each option. Respondents who selected "other" for a type of preparation were given the option to describe the other types of preparation they conducted with their students prior to their visit which focused on connecting their classroom curriculum with the field trip content. The comments revealed that the other types of preparation included presentations by a representative from the RELC, social skill development, team building exercises, slideshows from past years, units on environments and landforms, integrating literature, math, and science, and making connections between what the students were learning in class and how it would relate to the field trip content.

Table 9

*Frequency with which respondents conducted different types of **preparation** focused on connecting the field trip content with their formal classroom curriculum*

	N	Mean	Std. Deviation
Class discussions	56	5.18	0.74
Student projects about the field trip	53	2.32	1.44
Reflection (i.e. journaling)	54	3.65	1.60
I wove field trip related themes, concepts, or examples into my classroom curriculum	55	3.98	1.63
I used a field trip related theme to integrate a number of lessons and/or units in my curriculum	55	3.45	1.66
Other	10	3.20	2.20

Note. Based on a 6-point scale: 1=never, 2=very rarely, 3=rarely, 4= occasionally, 5= frequently, 6=very frequently.

Perceived barriers to preparation.

Respondents were asked to respond on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) the level to which they agreed that they were able to integrate their classroom curriculum with the field trip content through preparation activities. Fifty-two respondents answered this question. The mean response was 3.65 with a standard deviation of 0.90. The five respondents who indicated that they did not conduct preparation with their students prior to the field trip in the previous section did not answer this question, and five respondents elected to skip this question. Figure 10 shows the distribution of responses on the 5-point Likert scale.

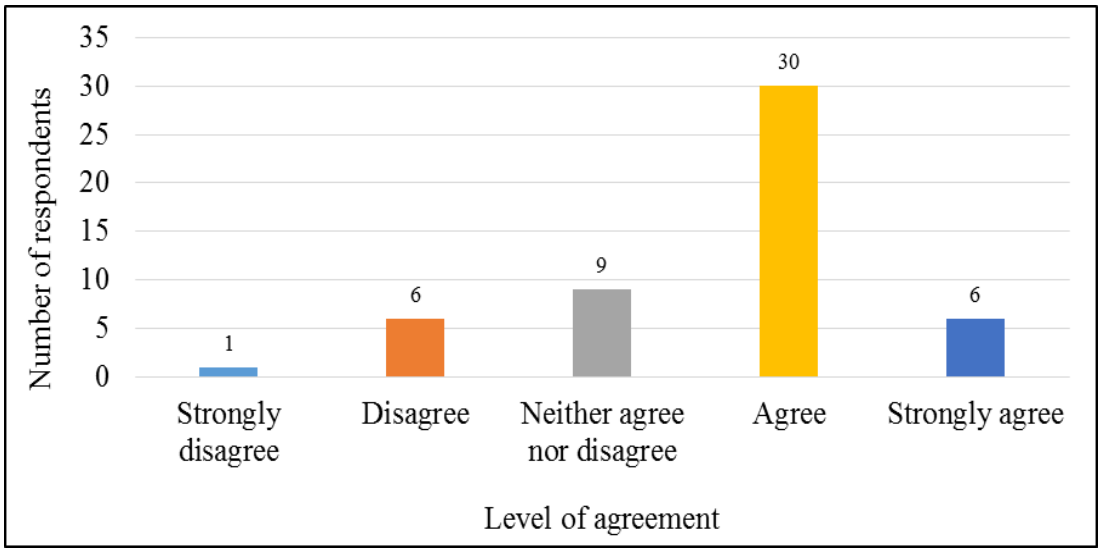

Figure 13. Respondents' level of agreement to the statement, "I was able to integrate my classroom curriculum with the field trip content through **preparation** activities."

The 57 respondents who conducted some type of preparation with their students prior to the field trip were asked to indicate on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) their level of agreement concerning what barriers prevented them from integrating their classroom curriculum with the field trip content to the extent that they desired prior to the field trip. Four different barriers were provided for them to respond to and they were also allowed to select "other" and comment on barriers extending beyond the four listed in the questionnaire. Table 10 shows the mean and standard deviations of each barrier, and how many teachers responded to each option. Respondents who selected "other" were given the option to describe the other types of barriers they perceived which prevented them from integrating their classroom curriculum with the field trip content to the extent they desired. The comments revealed that the other barriers included:

- Being unfamiliar with the programming at the RELC
- One respondent did not feel as though the subject they taught warranted preparation focused on curriculum integration

- Another respondent did not want to cover material that would be addressed at the RELC.

Overall, "lack of class time" was perceived as the main barrier but only with a mean of 3.22 which falls between "neither agree nor disagree" and "agree" on the Likert scale. These results suggest that respondents did not perceive any strong barriers to integrating their classroom curriculum with the field trip content to the extent that they desired prior to the field trip.

Table 10

*Respondents' level of agreement concerning what barriers prevented them from conducting preparation with students **prior to** the field trip*

Barrier	N	Mean	Std. Deviation
Lack of class time	50	3.22	1.33
Lack for formal training	49	2.16	1.11
Lack of resources	50	2.64	1.24
Lack of time (too close to beginning of school year)	45	2.20	1.27
Other	7	2.57	1.40

Note. Data from teacher respondents who do conduct **preparation** focused on integrating the field trip with their classroom curriculum. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree.

Independent t-tests were used to determine the statistical significance of the difference between the means in Table 10 for teachers with less than ten years teaching experience and teachers with ten or more years of teaching experience (Table 11). "Lack of resources" was the only barrier which the independent t-test demonstrated as having statistical significance between the means for teacher respondents with less than ten years teaching experience and ten or more years teaching experience. Table 12 shows the results of a One-Way ANOVA which determined the statistical significance of the difference between the means in Table 10 for public, private, and charter school teachers.

"Lack of class time" was the only barrier which the One-Way ANOVA demonstrated as having statistical significance between the means for public, private, and charter school teachers. The implications of these finding will be discussed further in Chapter 5.

Table 11

*Respondents' level of agreement concerning what barriers prevented them from conducting preparation with students **prior to** the field trip. Independent t-test comparing means for teachers with <10 years and 10+ years teaching experience*

Barrier	Mean		*p*
	<10 yrs	10+ yrs	
Lack of class time	3.50	3.11	0.358
Lack of formal training	2.57	2.00	0.103
Lack of resources	3.50	2.31	0.002*
Lack of time (too close to beginning of school year)	2.33	2.15	0.677

Note. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree.
*p < .05

Table 12

*Respondents' level of agreement concerning what barriers prevented them from conducting preparation with students **prior to** the field trip. One-Way ANOVA comparing means for public, private, and charter school teachers*

Barrier	Mean			*p*
	Public	Private	Charter	
Lack of class time	3.50	2.11	3.00	0.015*
Lack of formal training	2.16	2.00	2.67	0.673
Lack of resources	2.68	2.22	3.33	0.375
Lack of time (too close to beginning of school year)	2.35	1.50	2.33	0.233

Note. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree.
*p < .05.

The five respondents who indicated that they did not conduct any kind of preparation prior to the field trip focused on connecting the field trip content with the classroom curriculum were also asked what prevented them from doing so. They were

asked to indicate on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) their level of agreement concerning what barriers prevented them from integrating their classroom curriculum with the field trip content prior to the field trip. Five different barriers were provided for them to respond to and they were also allowed to select "other" and comment on barriers extending beyond the five provided in the questionnaire. Table 13 shows the mean and standard deviations of each barrier, and how many teachers responded to each option.

Table 13

*Respondents' level of agreement concerning what barriers prevented them from conducting preparation with students **prior to** the field trip*

Barrier	N	Mean	Std. Deviation
Lack of class time	5	2.20	1.30
The field trip too early in the year	5	1.20	0.45
Lack of resources	5	1.40	0.89
Did not feel it was necessary	5	2.00	1.73
Did not receive training on how to integrate field trip content with formal curriculum	5	2.80	1.64
Other	2	3.00	2.83

Note. Data from teacher respondents who **do not** conduct preparation focused on integrating the field trip with their classroom curriculum Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree.

The two respondents who selected "other" indicated that they did not teach the same grade level as the students that attended the field trip. These results suggest that respondents' lack of preparation focused on integrating the field trip content with formal curriculum is not attributable to the barriers listed. This will be discussed more fully in Chapter 5.

Follow-up.

Types of follow-up.

Forty-six (74.2%) of the respondents indicated that they conducted some type of follow-up with their students after the field trip focused on connecting the field trip experience with their classroom curriculum. Twelve (19.4%) did not conduct follow-up with their students after the field trip, one (1.6%) selected "other" in response to this question, and three (4.8%) respondents skipped this question. The respondent who selected "other" commented that they teach Math and so was limited in the types of follow-up they were able to conduct. The three respondents who skipped this question were not prevented from answering the rest on the questions in this section. The 12 respondents who indicated that they do not conduct follow-up with their students after the field trip did not answer the rest of the questions in this section but will be included in the following section of the data analysis which addresses types of perceived barriers to field trip follow-up focused on curriculum integration.

The rest of this section represents data from the other 50 respondents (the 46 who indicated that they conducted some type of follow-up with their students after the field trip, the one who selected "other" and the three who skipped the previous question). Of these, 35 (70%) taught a lesson after the field trip which related the field trip content with their classroom curriculum, 13 (26%) did not, and two respondents (4%) skipped this question. Table 14 shows the number of lessons conducted by the 35 respondents who do taught a lesson after the field trip. The respondents who either skipped the previous question or did not indicate that they teach a lesson after the field trip are not included in the table. One of the 35 respondents to this question selected "other" and commented that

they did not teach lessons specifically about the field trip, but instead related concepts that came up in their class to the field trip when applicable.

Table 14

*Number of lessons taught **after** the field trip focused on connecting the field trip content with their formal classroom curriculum*

Number of lessons	Frequency	Percent
Less than 5	24	68.57
5 or more	7	20.0
An entire unit was dedicated to connecting the field trip content with the classroom curriculum	1	2.86
Don't know	2	5.71
Other	1	2.86
Total	35	100.0

Respondents were also asked about the other types of follow-up they conducted with their students focused on connecting the field trip content with their classroom curriculum. Respondents were asked to respond on a 6-point Likert scale how much they conducted six different types of follow-up with their students. Table 15 shows the mean and standard deviations of each type of follow-up, and how many teachers responded to each option. Respondents who selected “other” for a type of follow-up were given the option to describe the other types of follow-up they conducted with their students after their visit which focused on connecting their classroom curriculum with the field trip content. The comments revealed that the other types of follow-up included students choosing to do reports, essays, or dioramas based on their experience, and finishing units on environments and landforms.

Table 15

*Frequency with which respondents conducted different types of **follow-up** focused on connecting the field trip content with their formal classroom curriculum*

	N	Mean	Std. Deviation
Class discussions	47	5.09	0.88
Student projects about the field trip	47	3.17	1.56
Reflection (i.e. journaling)	46	4.46	1.54
I wove field trip related themes, concepts, or examples into my classroom curriculum	44	4.36	1.35
I used a field trip related theme to integrate a number of lesson and/or units in my curriculum	43	3.81	1.48
Other	6	4.33	1.86

Note. Based on a 6-point scale: 1=never, 2=very rarely, 3=rarely, 4= occasionally, 5= frequently, 6=very frequently.

Perceived barriers to follow-up.

Respondents were asked to respond on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) the level to which they agreed that they were able to integrate their classroom curriculum with the field trip content through follow-up activities. Forty-five of the 50 respondents who indicated they conducted some type of follow-up with their students after the field trip answered this question. The mean response was 3.76 with a standard deviation of 1.00. The 12 respondents who indicated that they did not conduct follow-up with their students after the field trip in the previous section did not answer this question, and five respondents elected to skip this question. Figure 14 shows the distribution of responses on the 5-point Likert scale.

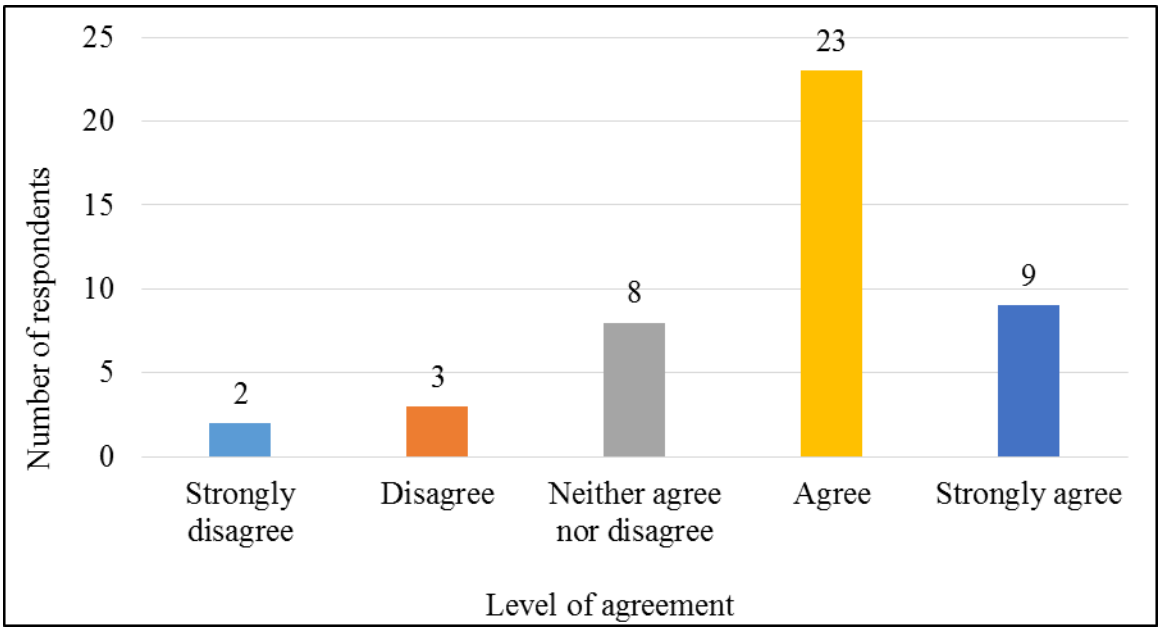

Figure 14. Respondents' level of agreement to the statement, "I was able to integrate my classroom curriculum with the field trip content through **follow-up** activities."

The 50 respondents who conducted some type of follow-up with their students after the field trip were asked to indicate on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) their level of agreement concerning what barriers prevented them from integrating their classroom curriculum with the field trip content to the extent that they desired after the field trip. Four different barriers were provided for them to respond to and they were also allowed to select "other" and comment on barriers extending beyond the four in the questionnaire. Table 16 shows the mean and standard deviations of each barrier, and how many teachers responded to each option.

Table 16

*Respondents' level of agreement concerning what barriers prevented them from conducting follow-up with students **after** the field trip*

Barrier	N	Mean	Std. Deviation
Lack of class time	44	3.18	1.24
Lack of formal training	44	2.32	1.12
Lack of resources	44	2.55	1.17
Lack of time (too close to the end of the school year)	42	2.62	1.48
Other	5	3.20	1.48

Note. Data from teacher respondents who do conduct **follow-up** focused on integrating the field trip with their classroom curriculum. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree.

Respondents (n=5) who selected "other" were given the option to describe the other types of barriers they perceived which prevented them from integrating their classroom curriculum with the field trip content to the extent they desired. The comments they provided revealed that the other barriers included other curriculum obligations and the fact that not every student went on the field trip so they didn't have the experience to relate back to the field trip. Overall, "lack of class time" was again perceived as one of the main barriers but only with a mean of 3.18 which falls between "neither agree nor disagree" and "agree" on the Likert scale. These results suggest that respondents did not perceive any strong barriers to integrating their classroom curriculum with the field trip content to the extent that they desired after the field trip.

Independent t-tests were used to determine the statistical significance of the difference between the means in Table 16 for teachers with less than ten years teaching experience and teachers with ten or more years of teaching experience (Table 17*).* "Lack of formal training" and "lack of resources" were the only barriers which the independent t-test demonstrated as having statistical significance between the means for teacher respondents with less than ten years teaching experience and ten or more years teaching

experience. Table 18 shows the results of a One-Way ANOVA which determined the statistical significance of the difference between the means in Table 16 for public, private, and charter school teachers. The One-Way ANOVA did not find any statistical significance of the difference between the means for public, private, and charter school teachers. The implications of these finding will be discussed further in Chapter 5.

Table 17

*Respondents' level of agreement concerning what barriers prevented them from conducting follow-up with students **after** the field trip. Independent t-test comparing means for teachers with <10 years and 10+ years teaching experience*

	Mean		
Barrier	<10 yrs	10+ yrs	*p*
Lack of class time	3.38	3.10	0.490
Lack of formal training	2.92	2.06	0.018*
Lack of resources	3.38	2.19	0.001**
Lack of time (too close to the end of school year)	2.73	2.58	0.782

Note. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree.
*p < .05. **p < .001.

Table 18

*Respondents' level of agreement concerning what barriers prevented them from conducting follow-up with students **after** the field trip. One-Way ANOVA comparing means for public, private, and charter school teachers*

	Mean			
Barrier	Public	Private	Charter	*p*
Lack of class time	3.35	2.50	3.00	0.217
Lack of formal training	2.32	2.12	3.00	0.621
Lack of resources	2.50	2.38	4.00	0.194
Lack of time (too close to the end of school year)	2.74	2.14	2.00	0.586

Note. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree.

The 12 respondents who indicated that they do not conduct any kind of follow-up after the field trip focused on connecting the field trip content with the classroom curriculum were also asked what prevented them from doing so. They were asked to indicate on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) their level of agreement concerning what barriers prevented them from integrating their classroom curriculum with the field trip content after the field trip. Five different barriers were provided for them to respond to and they were also allowed to select "other" and comment on barriers extending beyond the five provided in the questionnaire. Table 19 shows the mean and standard deviations of each barrier, and how many teachers responded to each option.

Table 19

*Respondents' level of agreement concerning what barriers prevented them from conducting follow-up with students **after** the field trip*

	N	Mean	Std. Deviation
Lack of class time	11	3.09	1.38
The field trip was too close to the end of the school year	10	1.50	0.97
Lack of resources	11	2.45	1.21
I did not feel it was necessary	11	3.09	1.30
I did not receive training on how to integrate field trip content with formal curriculum	11	2.72	1.27
Other	2	4.00	1.41

Note. Data from teacher respondents who **do not** conduct follow-up focused on integrating the field trip with their classroom curriculum. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

One of the respondents who selected "other" indicated that they did not conduct follow-up in their classroom because not all of their students went on the field trip so those students would not be able to relate to the topic in the same way as the students who did participate. The second respondent who selected "other" did not conduct follow-up for

the same reason they did not conduct any type of preparation as they teach a different grade than the students they accompanied on the field trip.

Resources obtained from the RELC.

The following section presents data from the 62 complete teacher questionnaires (n=62) about the types of resources they obtained from the RELC they visited with their students. Of the 62 respondents, 50 (80.7%) were informed of the overarching concepts and themes of the field trip prior to their visit, 8 (12.9%) indicated they were not, one (1.6%) responded "don't know", two (3.2%) responded "other", and one (1.6%) respondent skipped the question. Both of the respondents who selected "other" indicated that they were aware of the overarching concepts and themes from previous visits to the RELC. Fifty-two (83.9%) respondents indicated they were informed of the lessons and activities their students would participate in during the field trip prior to their visit, six (9.7%) indicated they were not, one (1.6%) selected "don't know" and three (4.8%) selected "other" and provided additional comments. These comments revealed that the teachers had either specifically chosen which classes their students would participate in or their long-standing history with the RELC meant they were aware of what their students would experience during the field trip. Respondents also indicated whether or not they received lesson plans/descriptions of the classes provided at the RELC before (Table 20) and after (Table 21) the field trip. For both questions, the respondents who selected "other" commented that they were very familiar with the programming at the RELC and had access to the lesson plans on the RELC websites. Eighteen (29.03%) respondents confirmed that the lesson plans/descriptions indicated which Minnesota academic standard(s) and/or benchmark(s) they addressed, 23 (37.10%) said the lesson plans/descriptions did not indicate this, 16 (25.81%) selected "don't know," one (1.61%)

selected “other” and four (6.45%) skipped the question. The respondent who selected “other” explained that it is understood that the RELC follows standards but written verification is not provided every year.

Table 20

*Number of teachers indicating they received lesson plans/descriptions **prior** to the field trip*

	Frequency	Percent
Yes	36	58.06
No	20	32.26
Don't know	3	4.84
Other	3	4.84
Total	62	100.0

Table 21

*Number of teachers indicating they received lesson plans/descriptions **after** the field trip*

	Frequency	Percent
Yes	14	22.58
No	40	64.52
Don't know	5	8.06
Other	1	1.61
Skipped question	2	3.23
Total	60	100.0

Table 22 outlines how the respondents acquired preparation materials from the RELCs. Respondents were allowed to select multiple answers, and the respondents who selected more than one contributed a frequency of 1 for each selected source of materials. The three respondents who selected “other” when asked how they acquired preparation materials indicated that they received them through personal conversations with the RELC, they were mailed, and they had to specifically ask for them. The ten respondents

who selected “I did not receive preparation materials” did not answer the rest of the questions about preparation materials received from the RELC.

Table 22

*Sources of **preparation** materials from the RELC*

Source	Frequency
RELC Website	26
They were emailed to me	21
Another teacher gave them to me	23
I specifically requested them from the RELC	7
I did not receive preparation materials	10
Other	3

Note. These data come from a multi-select question. Teachers were allowed to select more than one response. Respondents contribute a frequency of 1 for each option selected.

Respondents were asked whether or not they received preparation activity suggestions to conduct in their classroom prior to their visit. Of the 52 respondents who answered this question, 13 (25.00%) indicated they received such suggestions, 24 (46.16%) shared they did not receive these suggestions, 14 (26.92%) selected “I don’t know,” and one (1.92%) respondent selected “other.” Respondents were also asked whether or not they received preparation lesson suggestions to conduct in their classroom prior to their visit. Of the 50 respondents who answered this question, nine (18%) did receive such suggestions, 25 (50%) did not receive these suggestions, 15 (30%) selected “I don’t know,” and one (2%) selected “other.” The respondent who selected “other” explained that the teachers intentionally do not provide a lot of preparation prior to the field trip. This respondent also explained that the goal of the experience in team building and leadership, and too much preparation would compromise the experience.

Respondents were asked to respond on a 6-point Likert scale from never (1) to very frequently (6) the frequency with which they used preparation materials provided by

the RELC to integrate the field trip content with their classroom curriculum before the field trip. Thirty-six teachers responded to this question, with a mean of 3.06 and a standard deviation of 1.74. The distribution of responses is shown in Figure 15. Teachers were also asked on the same scale to respond to how much they used the lesson plans/descriptions of the classes provided at the RELC to integrate the field trip content with their classroom curriculum before the field trip. Thirty-eight teachers responded to this question, with a mean of 3.18 and a standard deviation of 1.66. The distribution of responses is shown in Figure 16.

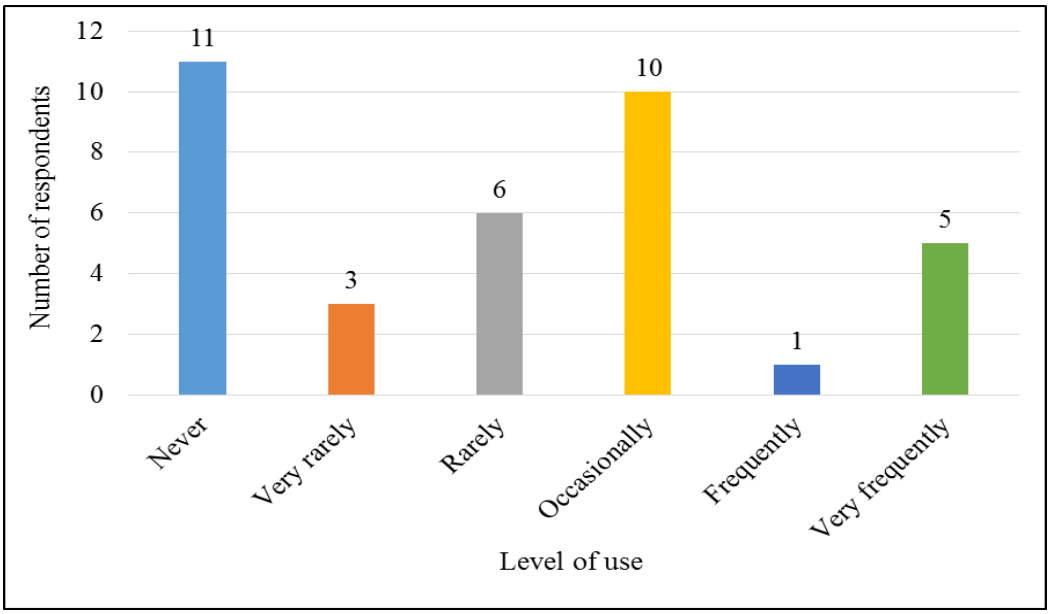

Figure 15: Frequency with which respondents used preparation materials provided by the RELC to integrate the field trip content with their classroom curriculum **before** the field trip

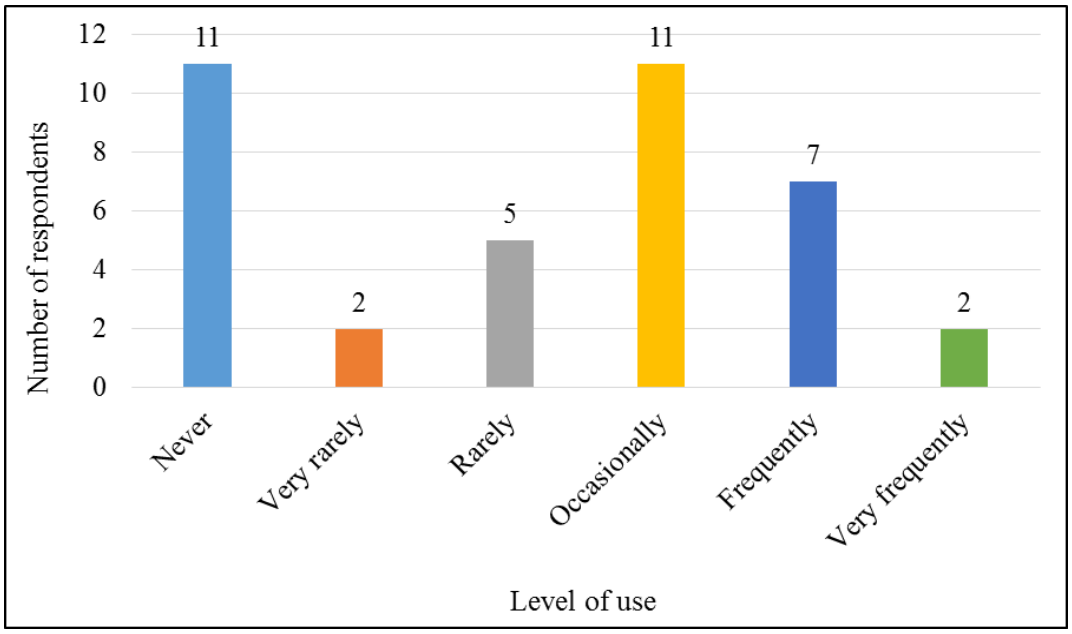

Figure 16: Frequency with which respondents used the lesson plans/descriptions of the classes provided by the RELC to integrate the field trip content with their classroom curriculum **before** the field trip.

Table 23 outlines how the respondents acquired follow-up materials from the RELCs. Respondents were allowed to select multiple answers, and the respondents who selected more than one contributed a frequency of 1 for each selected source of materials. Of the four respondents who selected "other" when asked how they acquired follow-up materials, one did not recall and another commented that the teachers created follow-up materials themselves. The 37 respondents who selected "I did not receive follow-up materials" did not answer the rest of the questions about follow-up materials received from the RELC.

Table 23

*Sources of **follow-up** materials from the RELC*

Source	Frequency
RELC Website	11
They were emailed to me	6
Another teacher gave them to me	7
I specifically requested them from the RELC	1
I did not receive follow-up materials	37
Other	4

Note. These data come from a multi-select question. Teachers were allowed to select more than one response. Respondents contribute a frequency of 1 for each option selected.

Respondents were asked whether or not they received follow-up activity suggestions to conduct in their classroom after their visit. Of the 19 respondents who answered this question, five (26.32%) indicated they did receive such suggestions, five (26.32%) did not, and nine (47.36%) selected "I don't know." Respondents were also asked whether or not they received follow-up lesson suggestions to conduct in their classroom after their visit. Of the 19 respondents who answered this question, four (21.05%) indicated they did receive such suggestions, five (26.32%) did not, and 10 (52.63%) selected "I don't know."

Respondents were asked to respond on a 6-point Likert scale from never (1) to very frequently (6) how much they used follow-up materials provided by the RELC to integrate the field trip content with their classroom curriculum after the field trip. Thirteen teachers responded to this question, with a mean of 2.77 and a standard deviation of 1.42. The distribution of responses is shown in Figure 17. Teachers were also asked on the same scale to respond to how much they used the lesson plans/descriptions of the classes provided at the RELC to integrate the field trip content with their classroom curriculum after the field trip. Thirteen teachers responded to this

question, with a mean of 2.85 and a standard deviation of 1.57. The distribution of responses is shown in Figure 18.

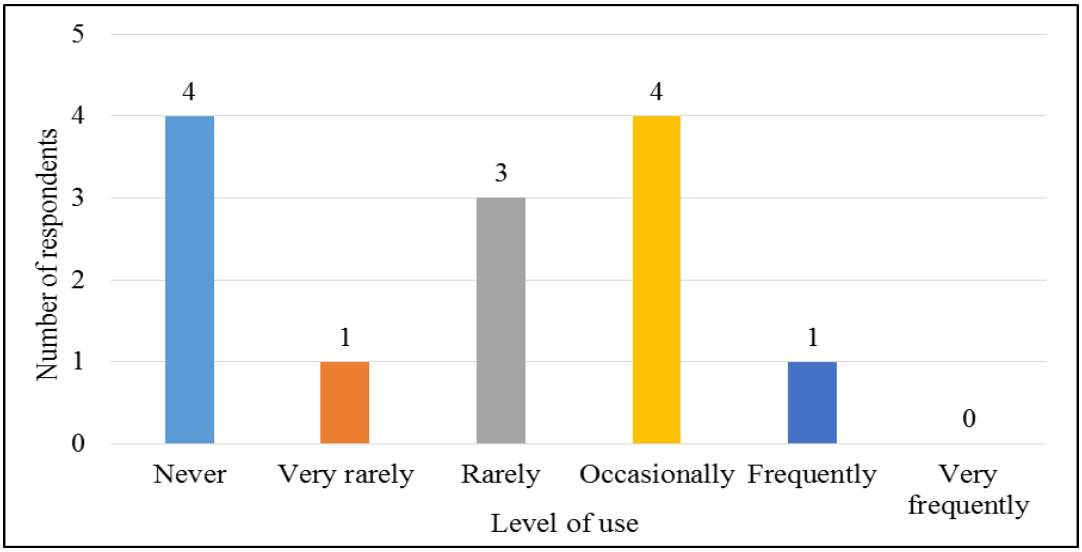

Figure 17: Frequency with which respondents used follow-up materials provided by the RELC to integrate the field trip content with their classroom curriculum **after** the field trip

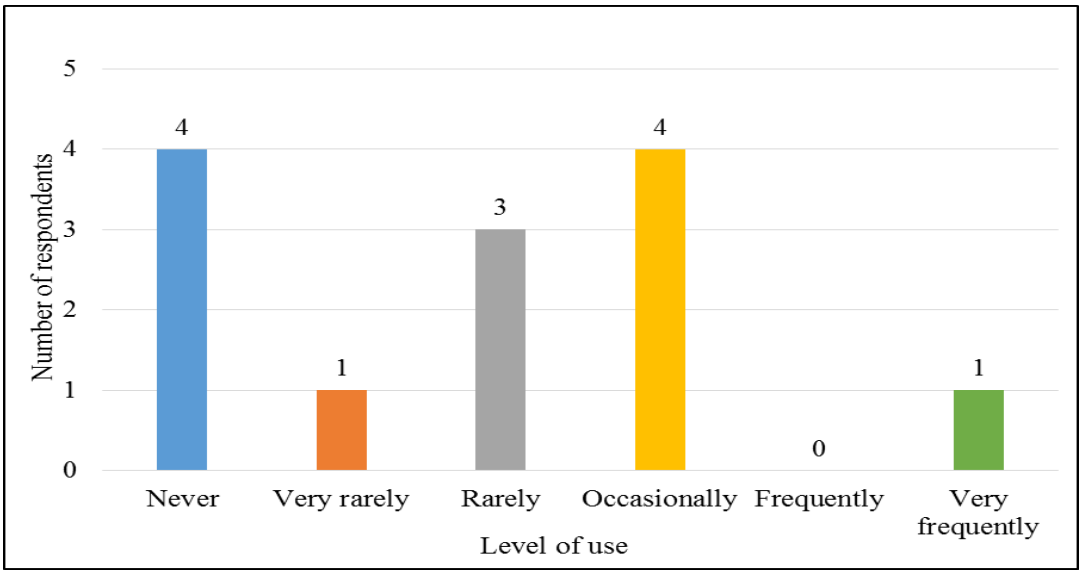

Figure 18: Frequency with which respondents used the lesson plans/descriptions of the classes provided at the RELC to integrate the field trip content with their classroom curriculum **after** the field trip.

Respondents were asked on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) the level to which they agreed with the usefulness of various aspects of resources provided by the RELC. Table 24 shows the mean, standard deviations, and how

many teachers responded to each option. Two of the respondents who selected "other" commented that resources are also useful if they introduce the people the students will be working with, or they included suggested lessons. Respondents were also given the opportunity to list and describe any other types of resources that would enhance the integration of the field trip experience with their classroom curriculum. These comments are discussed in Chapter 5.

Table 24

Respondents level of agreement of the usefulness of various types of resources

Resources are useful if they:	N	Mean	Std. Deviation
List state academic standards/benchmarks	58	3.69	1.06
Orient students and teachers to field trip content	61	4.20	0.89
Orient students and teachers to the field trip location and setting	61	4.05	.88
Other	6	3.50	1.38

Note. Based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree.

Summary

This chapter summarized the results of the two instruments used in this survey research. Results showed that there are inconsistencies between the RELCs in terms of the resources they provide to teachers before and after field trips. Teachers welcome preparation and follow-up materials but face similar barriers to integrating field trips into their formal curriculum as those that have been stated in research for over 30 years. In addition, the types of preparation and follow up teachers conduct with their students fall on a wide spectrum, similar to past research findings. The following chapter will discuss how these data answer the three research questions posed by this study.

Chapter 5

Discussion

The purpose of this study was to describe the preparation and follow-up Minnesota teachers conducted with their students before and after an extended field trip to a residential environmental learning center. This study also describes how these teachers connected such trips to their formal curriculum. In addition, the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities is determined. This chapter is divided into the following sections: a discussion of results focused on how the results in Chapter 4 answer the research questions that guided this study, the implications of this study, recommendations for future research, and a conclusion.

Discussion of Results

Each of the three research questions are addressed separately. The discussion draws on results from both survey instruments and connects back to the literature review and the theoretical frameworks introduced in Chapter 2.

Research question 1: How do teachers connect outdoor learning experiences at RELCs with the formal classroom curriculum through preparation and follow-up activities?

The results indicate that the majority of the teacher respondents conducted preparation and follow-up focused on connecting the field trip experience with their classroom curriculum before and after field trips to residential environmental learning centers. Fifty (80.6%) teacher respondents indicated they conducted follow-up focused on connecting the field trip experience with their classroom curriculum and 55 (88.7%) indicated they conducted preparation focused on connecting the field trip experience with

their classroom curriculum with their students. It should also be noted that 45 (72.6%) of the teacher respondents indicated that they conducted both preparation and follow-up focused on connecting the field trip experience with their classroom curriculum.

Past research has found that types of preparation and follow-up cover a wide range:

> Interview and observation data suggested that the level of connection between a field trip and the curriculum covered a range: from a fully integrated field trip, complete with pre- and post-visit activities that built on the experience and corresponded to state science standards; to a casual sense of implicit connection that teachers believed would be obvious to students without much discussion back at the classroom. (Anderson et al., 2006, p. 370)

Because of this, additional questions were asked in order to determine the degree to which preparation and follow-up conducted by teachers before and after field trips to RELCs focused on integrating the field trip content with formal classroom curriculum. The majority of respondents, 39 (63%), taught a lesson prior to the field trip relating the field trip content with their classroom curriculum, and 35 (56%) taught a lesson after the field trip relating the field trip content with their classroom curriculum. On a 6-point Likert scale from never (1) to very frequently (6), “class discussions” was the only type of preparation that teacher respondents indicated they conducted frequently before and after field trips to RELCs (mean=5.18). On the same 6-point Likert scale, the results show that teacher respondents very rarely had their students do projects about the field trip, and occasionally prepared students by weaving field trip related themes, concepts, or examples into their classroom, and occasionally used a field trip related theme to

integrate a number of lessons and/or units in their curriculum. The results also show that these practices were more commonly done after the field trip.

Responses also indicate that resources provided by the RELC were not frequently utilized by teachers to integrate field trip content with formal classroom curriculum. On a 6-point Likert scale from never (1) to very frequently (6), teacher respondents on average (mean=3.06) rarely used resources provided by the RELC before their field trip to integrate the field trip with their formal curriculum, and on average (mean=2.77) very rarely to rarely used the resources provided by the RELC after the field trip to integrate field trip content with formal classroom curriculum.

While the majority of teacher respondents did conduct preparation and follow-up that focused on connecting the field trip experience with their classroom curriculum before and after field trips to RELCs, the answers and comments provided by some respondents indicate that some of the preparation and follow-up efforts focused on connecting the field trip with formal classroom curriculum were informal, opportunistic connections rather than intentional, structured integration. These findings support previous research efforts which studied how teachers integrate field trip experiences into formal classroom curriculum (Anderson et al., 2006; Storksdieck, 2006; Tal, Bamberger, & Morag, 2005; Tal et al., 2014). Comments provided by teacher respondents indicated that some teachers referenced the field trip and connected the field trip experience with their classroom curriculum when relatable topics came up, but did not teach lessons specifically about the field trip.

Some responses also implied a lack of knowledge in field trip-specific pedagogy. One teacher respondent commented that their preparation of students for the field trip was not extensive because they didn't want to "steal the thunder" from the RELC and

another commented that a lack of preparation was intentional so as not to "compromise the experience." These viewpoints stand contrary to research literature, which widely supports preparation efforts focused on integration of field trip content and classroom curriculum as a means to maximize the educational benefits of field trips (Anderson et al., 2006; DeWitt & Storksdieck, 2008; Orion, 1993; Tal et al., 2014).

Prior research also outlines the importance of preparation in order to reduce novelty and enhance learning (Falk et al., 1978; Hurd, 1997; Kubota & Olstad, 1991; Martin, Falk, & Balling, 1981; Orion, 1993). There is also theoretical support for preparing and follow-up field trip experiences. Subsumption Theory and Constructivism both outline the role of prior knowledge and understanding in future learning. The implications for field trips are that without adequate preparation, students might not begin a field trip with enough prior knowledge and experience to construct new knowledge from their experience. This is especially true if the field trip introduces new concepts that students have never been exposed to through school or at home. The models, outlined in Chapter 2, for best practices in field trips proposed by Orion (1993), Storksdieck (2006), and Morag and Tal (2010) also support the importance of integrating field trips into formal curriculum through preparation and follow-up efforts.

Responses also revealed that a lack of preparation and follow-up efforts was sometimes attributable to the subject area taught by teacher respondents at their schools. Some teacher respondents commented that they were unable to prepare and follow-up from the field trip in their classroom because they teach a subject other than science. This viewpoint reflects the common misconception that environmental education is not interdisciplinary (Ham & Sewing, 1987; Wade, 1996). No other strong barriers to preparation and/or follow-up were identified by the teacher respondents who indicated

that they do not conduct any type of preparation or follow-up with their students focused on connecting the field trip experience with their classroom curriculum. Data showed that, while the majority of teachers did conduct some degree of preparation and follow-up related to their RELC experience, lack of understanding of the importance of preparation and follow-up on students' learning contributed to underutilization of the field trip experience in some cases.

Research question 2: How do RELCs support the integration of the field trip into formal education?

The majority of teacher respondents indicated they were informed of the overarching themes and concepts of the field trip prior to the visit (80.6%) and were informed of the lessons and activities their students would participate in at the RELC (83.9%). However, only 58.1% were provided with lesson plans/descriptions of the classes provided at the RELC before their field trip. As described in the previous section, the preparation and follow-up resources provided by the RELCs were not frequently utilized by the teacher respondents. Additional research would be needed to determine if lesson plans and/or descriptions of the classes provided at the RELC would enhance utilization of RELC resources and/or affect preparation and/or follow-up efforts by teachers.

The program/education directors of the RELCs selected to participate in this study all indicated that they do provide preparation to teachers prior to their visit. When asked on a 5-point Likert scale, from strongly disagree (1) to strongly agree (5), the level to which they agreed their preparation materials indicate how to connect the field trip content with formal classroom curriculum, 50% of RELC program/education directors surveyed disagreed and 50% agreed that their preparation materials do indicate how to

make those connections. When asked the same question about the follow-up materials they provided to teachers, only 25% disagreed while 75% of the RELC education/program directors agreed that their follow-up materials do indicate how to connect the field trip content with formal classroom curriculum. The program/education directors were not asked in what ways their preparation and/or follow-up materials indicate how to make these connections. This information would be valuable to determine in future research efforts focused on how RELCs support the integration of their programming with formal classroom curriculum.

To answer this research question, responses from the RELC program/education directors and teachers were also compared. The results indicate that there are discrepancies between the two sets of responses. All four program/education directors indicated that their RELC provide follow-up materials to teachers after their visit, but 60% of the teacher respondents indicated that they did not receive follow-up materials from the RELC they visited with their students. In addition, while 50% of the RELCs indicated that they provide preparation lessons and activities to be conducted in the classroom prior to the students' visit, only 21% of teacher respondents indicated that they received preparation activity suggestions and only 14.5% of teacher respondents indicated that they received preparation lesson suggestions to be conducted in their classroom prior to their visit to the RELC.

The same discrepancy can be seen for follow-up materials. While 50% of the RELCs indicated they provide follow-up lessons and activities to be conducted in the classroom after the students' visit, only 8.1% of teacher respondents indicated that they received follow-up activity suggestions, and only 6.5% indicated that they received follow-up lesson suggestions to be conducted in their classroom after their visit to the

RELC. These discrepancies have important implications for both teachers and RELCs. It is evident from these results that the availability of resources provided by the RELCs was not effectively communicated to all the teachers who attend the programs with their students.

These findings are significant because more effective communication and sharing of resources between RELCs and teachers may enhance preparation and follow-up efforts. Past research has shown that preparation and follow-up activities improve student learning outcomes (Anderson et al., 2000; Farmer & Wott, 1995; Orion & Hofstein, 1994). Additional research would be required to determine what types of resources field trip venues could supply that would more effectively support teacher preparation and follow-up efforts.

Research question 3: What do teachers perceive as being needed to better support curricular integration and their preparation and follow-up efforts for an extended field trip to an RELC?

The results suggest that teacher respondents did not face any strong barriers to integrating their classroom curriculum with the field trip content through preparation and follow-up to the extent that they desired (See Figures 13 & 14). Some barriers, which are described above, seemed to occur when teachers who participated in field trips to RELCs with students either taught a different grade than the students on the field trip or taught a subject other than science. As discussed earlier in this chapter, the notion that the subject taught by a teacher could act as a barrier to that teacher integrating an EE field trip with formal curriculum reflects the common misconception that environmental education is not interdisciplinary. Other comments revealed that some teachers viewed the field trip experience to the RELC as more of a social skill development and team building

opportunity. In these cases, extensive preparation and follow-up focused on connecting the classroom curriculum with the field trip content may not have been a main priority. However, the findings do suggest that teachers still value the RELC experience.

Teacher respondents indicated that resources provided by RELCs are most useful if they list state academic standards and/or benchmarks, orient students and teachers to the field trip content and field trip location and setting. The desire for resources that orient students to the field trip location and setting supports the *Model for the Development and Implementation of Field Trips as an Integral Part of the Science Curriculum* presented by Orion (1993). This model emphasizes that proper field trip preparation includes reducing the geographical novelty of a field trip setting prior to the field trip experience. Other resources teacher respondents identified which would enhance the integration of the field trip experience with their classroom curriculum included:

- Activities that integrate many subjects
- Supplemental information and quantitative data about the content covered during the field trip (e.g. Math teachers)
- Electronic guides to the camp and surrounding area
- Outlines of the activities offered at the RELC
- Standards-based lessons and/or activities to conduct in the classroom before and/or after the field trip

These preferences are important for RELC program/education directors to know so they can better support teachers who bring students to their residential programs.

The results of the independent t-tests and One-Way ANOVAs shown in Tables 11, 12, 17, and 18 reveal how barriers to preparation and follow-up varied between

teachers with less than ten versus those with ten or more years teaching experience, as well as between public, private, and charter school teachers. The independent t-tests compared the mean responses between teachers with less than ten and ten or more years teaching experience. The independent t-test found a significant difference between the two groups' mean responses in reference to the factor "lack of resources" as a barrier to conducting both preparation and follow-up (Tables 11 & 17). Teachers with ten or more years of teaching experience perceived "lack of resources" as less of a barrier than did teachers with less than 10 years of teaching experience. This may be attributed to the fact that as teachers become more familiar with the program, they become more aware of what resources are available to them. Comments provided by teacher respondents in this study reveal that long-standing relationships with RELCs improved preparation and follow-up efforts. One teacher respondent commented, "The more deeply I know the program and people, the better I can connect."

While no statistical significance was found in the One-Way ANOVA test which compared the difference of means for barriers to follow-up between public, private, and charter school teachers, there was a statistical significance in the difference of the means for barriers to preparation between public, private, and charter school teachers. This may be explained by the notion that public and charter school teachers are often constrained more by state academic standards and curriculum demands than teachers in private schools.

The results of these tests demonstrate that the type of school (public, private, or charter) teachers work for and the number of years of teaching experience do influence the barriers they perceive as preventing them from conducting preparation and follow-up

with their students that focuses on integrating the field trip content with their formal classroom curriculum.

Implications

The results presented in this study found that the majority of teachers who attended field trips to RELCs with their students have been teaching for more than 10 years (n=43, 69.4%)) and have accompanied their students to RELCs more than six times (n=35, 56.5%)). The results of this study are not generalizable to all teachers who accompany their students on field trips, so additional research would be required to determine if this trend holds for different locations and for different types of field trips.

The results of this study also imply that teacher respondents perceived that they were not confronted with strong barriers to conducting preparation and follow-up with their students focused in integrating the field trip content with their formal curriculum. Thirty-six (58.1%) teacher respondents agreed or strongly agreed that they were able to integrate their classroom curriculum with the field trip content through preparation activities, and thirty-two indicated the same for follow-up activities. This lack of perceived barriers stands in contrast with past research, which has found that teachers encounter many barriers which prevent them from conducting preparation and follow-up before and after field trips (Anderson et al., 2006; Griffin, 2004; Kisiel, 2005; Rickinson et al., 2004).

The results presented in this study also have implications for the resources that RELCs should consider providing teachers before and after their visits. Teacher respondents identified standards-based resources as highly useful in integrating the field trip with their formal classroom curriculum. This supports other studies which have found that teachers are under pressure to justify how a field trip is connected with formal

instructional requirements and how it can support mandated curriculum (Anderson et al., 2006b; DeWitt & Storksdieck, 2008; Kisiel, 2005). The disparities found between teacher respondents and RELC program/education director respondents concerning what resources were provided to teachers before and after field trips point to the need for increased communication with all the teachers involved in a field trip with students.

Recommendations

Future research focused specifically on the types of resources teachers perceive as facilitating the integration of field trips with formal classroom curriculum would be a valuable addition to field trip research. The results from this study indicate that resources provided by the RELCs are not frequently used by teachers to integrate the field trip experience with their classrooms. This is important to address because research has shown the benefits of orienting and introducing students to concepts they will encounter to reduce the effect of the novel field trip phenomenon (Falk & Balling, 1982; Morag & Tal, 2012; Orion, 1993; Storksdieck, 2006). Past studies have found that the inherent disconnect between formal and non-formal learning environments contributes to inadequate curricular integration of field trips with the formal classroom. This disconnect could be addressed by an increased understanding of what teachers need from RELCs to facilitate this integration. One teacher respondent in this study commented that, "…time is limited so materials that would connect state standards to the content that will be taught to help prepare them [the students] would be great. The less time it takes for me to get familiar the better." Research that continues to address needs such as these can contribute to field trips being utilized to their full potential as valuable and vital learning experiences.

In conjunction with this point, research focused on teachers' perceptions of the role of preparation and follow-up in the field trip experience would be beneficial. Comments provided by teacher respondents in this study revealed that some teachers perceived preparation focused on integrating the field trip content with formal curriculum as detracting from the experience. This is contrary to the research which supports reducing to a degree the novelty of a field trip setting and introducing applicable concepts prior to the field trip in order to maximize learning (Anderson et al., 2006; DeWitt & Storksdieck, 2008; Orion, 1993; Tal et al., 2014). Additional research about teachers' perceptions and understanding of field trip pedagogy can guide professional development efforts for pre-service and in-service teachers.

Research which determines the depth and degree of field trip preparation and follow-up that teachers conduct with their students would also be valuable. Past research has found that types of preparation and follow-up cover a wide range, from casual connections to full integration (Anderson et al., 2006). Teachers were asked about the degree to which they conducted preparation and follow-up before and after their field trip to an RELC focused on integrating the field trip content with formal classroom curriculum. Because all responses were self-reported, it would be useful to study the types and amount of preparation and follow-up teachers conduct in more detail.

Conclusion

The need for quality environmental education is of paramount importance today in a world wrought with complex environmental issues, an unaware and disengaged citizenry, and children who are increasingly isolated from the natural world (Nabhan, 1995; Storksdieck, 2006). Field trips are just one strategy used to integrate environmental education into the formal classroom. The value of field trips as an effective education

tool is widely supported (Anderson, Kisiel, & Storksdieck, 2006; DeWitt & Storksdieck, 2008; Erdogan, Usak, & Bahar, 2013; Manzanal, Barreiro, & Jimenez, 1999; Orion, 1993; Storksdieck, 2006; Tal, Alon, & Morag, 2014), so it should be a priority to make sure these experiences are not underutilized. A key component to field trips reaching their full potential is ensuring that they are not an isolated experience separate from formal curriculum.

This study sought to describe the preparation and follow-up Minnesota teachers conducted with their students before and after an extended field trip to a residential environmental learning center, how these teachers connected such trips to formal curriculum, and the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities. This study serves as an initial step towards a greater understanding of how extended field trips to RELCs in Minnesota can be integrated into the formal classroom and what research efforts are needed to support these understandings.

References

Alberti, E., & Witryol, S. (1994). The relationship between curiosity and cognitive ability in third- and fifth-grade children. *The Journal of Genetic Psychology*, *155*(2), 129–145.

Anderson, D., Kisiel, J., & Storksdieck, M. (2006a). Understanding teachers' perspectives on field trips: discovering common ground in three countries. *Curator: The Museum Journal*, *49*(3), 365–386.

Anderson, D., Kisiel, J., & Storksdieck, M. (2006b). Understanding teachers' perspectives on field trips: discovering common ground in three countries. *Curator: The Museum Journal*, *49*(3), 365–386.

Anderson, D., Lucas, K., & Ginns, I. (2000). Development of knowledge about electricity and magnetism during a visit to a science museum and related post-visit activities. *Science Education*, *84*(5), 658–679. doi:10.1002/1098-237X(200009)84:5<658::AID-SCE6>3.0.CO;2-A

Anderson, D., & Zhang, Z. (2003). Teacher perceptions of field-trip planning and implementation. *Visitor Studies Technology*, *6*(3), 6–11.

Ausubel, D. (1962). A subsumption theory of meaningful verbal learning and retention. *The Journal of General Psychology*, *66*, 213–224.

Ausubel, D. (1963). Cognitive structure and the facilitation of meaningful verbal learning. *Journal of Teacher Education*, *14*, 217–222. doi:10.1177/002248716301400220

Ausubel, D. (1968). *Educational Psychology: A Cognitive View*. New York, NY: Holt, Rinehart, and Winston, Inc.

Babbie, E. (2011). *The Basics of Social Research* (5th ed.). Chapman University, CA: Wadsworth Cengage Learning.

Ballantyne, R., & Packer, J. (2002). Nature-based excursions: school students' perceptions of learning in natural environments. *International Research in Geographical and Environmental Education*, *11*(3), 218–236. doi:10.1080/10382040208667488

Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York, NY: McGraw-Hill, Inc.

Bodner, G. (1986). Constructivism: a theory of knowledge. *Journal of Chemical Education*, *63*(10), 873–878.

Bogner, F. (2002). The influence of a residential outdoor education programme to pupil's environmental perception. *European Journal of Psychology of Education*, *17*(1), 19–34.

Caine, R. N., & Caine, G. (1990). Understanding a brain-based approach to learning and teaching. *Educational Leadership*, *48*(2), 66–70.

Carrier, S. (2009). The effects of outdoor science lessons with elementary school students on preservice teachers' self-efficacy. *Journal of Elementary Science Education*, *21*(2), 35–48. doi:10.1007/BF03173683

Coughlin, P. (2010). Making field trips count: collaborating for meaningful experiences. *The Social Studies*, *101*(5), 200–210.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Los Angeles, CA:SAGE Publications, Inc.

Davidson, S., & Carber, S. (Eds.). (2009). *Taking the PYP Forward: The future of the IB Primary Years Programme*. Glasgow, Scotland: John Catt Educational Ltd.

Dettmann-Easler, D., & Pease, J. (1999). Evaluating the effectiveness of residential environmental education programs in fostering positive attitudes towards wildlife. *Journal of Environmental Education*, *31*(1), 33–39. doi:10.1080/00958969909598630

Dewey, J. (1938). *Experience and Education* (1st ed.). New York, NY: Touchstone.

DeWitt, J., & Osborne, J. (2007). Supporting teachers on science-focused school trips: towards an integrated framework of theory and practice. *International Journal of Science Education*, *29*(6), 685–710.

DeWitt, J., & Storksdieck, M. (2008). A short review of school field trips: key findings from the past and implications for the future. *Visitor Studies*, *11*(2), 181–197. doi:10.1080/10645570802355562

Dillon, J., Rickinson, M., Teamey, K., Morris, M., Young Choi, M., Sanders, D., & Benefield, P. (2006). The value of outdoor learning: evidence from research in the UK and elsewhere. *School Science Review*, *87*(320), 107–111.

Disinger, J., & Howe, R. (1990). *Trends and issues related to the preparation of teachers for Environmental Education*. Columbus, OH.

Duman, B. (2010). The Effects of Brain-Based Learning on the Academic Achievemnet of Students with Different Learning Styles. *Educational Sciences: Theory & Practice*, *10*(4), 2077–2103.

Environmental Education & Training Partnership. (2004). How environmental education is used in schools. *Environmental Education & Training Partnership Resource Library*, *120*.

Erdogan, M., Usak, M., & Bahar, M. (2013). A review of research on environmental education in non-traditional settings in Turkey, 2000 and 2011. *International Journal of Environmental and Science Education*, *8*(1), 37–57.

Eshach, H. (2007). Bridging in-school and out-of-school learning: formal, non-formal, and informal education. *Journal of Science Education and Technology*, *16*(2), 171–190. doi:10.1007/s10956-006-9027-1

Falk, J. H., & Balling, J. D. (1982). The Field Trip Milieu: Learning and Behavior as a Function of Contextual Events. *Journal of Educational Research*, *76*(1). Retrieved from https://login.libpdb.d.umn.edu:2443/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=4906683&site=ehost-live

Falk, J., Martin, W. W., & Balling, J. D. (1978). The novel field-trip phenomenon: adjustment to novel settings interferes with task learning. *Journal of Research in Science Teaching*, *15*(2), 127–134.

Farmer, A., & Wott, J. (1995). Field trips and follow-up activities: fourth graders in a public garden. *Journal of Environmental Education*, *27*(1), 33–35.

Farmer, J., Knapp, D., & Benton, G. (2007). An elementary school environmental education field trip: long-term effects on ecological and environmental knowledge and attitude development. *The Journal of Environmental Education*, *38*(8), 33–42. doi:10.3200/JOEE.38.3.33-42

Gilbertson, K. (1990). *Environmental literacy: outdoor education training and its effect on knowledge and attitude toward the environment* (Doctoral). Ohio State University, Columbus, OH.

Glisczinski, D. (2011). Lighting up the mind. *International Journal for the Scholarship of Teaching and Learning*, *5*(1), 1–13.

Griffin, J. (2004). Research on students and museums: looking more closely at the students in school groups. *Science Education*, *88*(1), 59–70. doi:10.1002/sce.20018

Griffin, J., & Symington, D. (1998). Moving from task-oriented to learning-oriented strategies on school excursions to museums. *Science Education*, *81*(6), 763–779. doi:10.1002/(SICI)1098-237X(199711)81:6<763::AID-SCE11>3.0.CO;2-O

Ham, S. H., & Sewing, D. R. (1987). Barriers to environmental education. *The Journal of Environmental Education, 19*(2), 17-24.

Hurd, D. (1997). Novelty and its relation in field trips. *Education*, *118*(1), 29–35.

Kisiel, J. (2005). Understanding elementary teacher motivations for science fieldtrips. *Science Education*, *89*(6), 936–955. doi:10.1002/sce.20085

Kisiel, J. (2013). Introducing future teachers to science beyond the classroom. *Journal of Science Teacher Education*, *24*(1), 67–91. doi:doi: 10.1007/s10972-012-9288-x

Knapp, D., & Poff, R. (2001). A qualitative analysis of the immediate and short-term impact of an environmental interpretive program. *Environmental Education Research*, *7*(1), 55–65. doi:10.1080/13504620124393

Krepel, W. J., & Duvall, C. R. (1981). *Field trips: A guide for planning and conducting educational experiences*. Washington, D.C.: National Education Association.

Kubota, C., & Olstad, R. (1991). Effects of novelty-reducing preparation on exploratory behavior and cognitive learning in a science museum setting. *Journal of Research in Science Teaching*, *28*(3), 225–234.

Leatherbury, M. (2011). *Connecting field trip and classroom learning: evaluating the utility of a museum-based framework in an Environmental Education context* (Masters). University of Wisconsin, Stevens Point, Stevens Point, WI.

Lisowski, M., & Disinger, J. (1991). The effect of field-based instruction on student understandings of ecological concepts. *Journal of Environmental Education*, *23*(1), 19–23.

Manzanal, R. F., Barreiro, L. M. R., & Jimenez, M. C. (1999). Relationship between ecology fieldwork and student attitudes toward environmental protection. *Journal of Research in Science Teaching*, *36*(4), 431–453.

Martin, W., Falk, J., & Balling, J. (1981). Environmental effects on learning: the outdoor field trip. *Science Education*, *65*(3), 301–309.

Michie, M. (1998). Factors influencing secondary science teachers to organize and conduct field trips. *Australian Science Teachers Journal*, *44*(4), 43–50.

Morag, O., & Tal, T. (2012). Assessing learning in the outdoors with the field trip in natural environments (FiNE) framework. *International Journal of Science Education*, *34*(5), 745–777. doi:10.1080/09500693.2011.599046

Nabhan, G. P. (1995). *The Geography of Childhood: Why Children Need Wild Places*. Boston, MA: Beacon Press.

Nadelson, L., & Jordan, J. R. (2012). Student attitudes toward and recall of outside day: an environmental science field trip. *The Journal of Educational Research*, *105*(3), 220–231. doi:10.1080/00220671.2011.576715

Novak, J. (1976). Understanding the learning process and effectiveness of teaching methods in the classroom, laboratory, and field. *Science Education*, *60*(4), 493–512.

Orion, N. (1993). A model for the development and implementation of field trips as an integral part of the science curriculum. *School Science and Mathematics*, *93*(6), 325–331. doi:10.1111/j.1949-8594.1993.tb12254.x

Orion, N., & Hofstein, A. (1991). *Factors which influence learning ability during a scientific field trip in a natural environment*. Lake Geneva, WI.

Orion, N., & Hofstein, Avi. (1994). Factors that influence learning during a scientific field trip in a natural environment. *Journal of Research in Science Teaching*, *31*(10), 1097–1119.

Priest, S. (1986). Redefining outdoor education: a matter of many relationships. *Journal of Environmental Education*, *17*(3), 13–15.

Rebar, B. (2012). Teachers' sources of knowledge for field trip practices. *Learning Environments Research*, *15*(1), 81–102. doi:10.1007/s10984-012-9101-y

Rickinson, M., Dillon, J., Teamey, K., Morris, M., Young Choi, M., Sanders, D., & Benefield, P. (2004). A review of research on outdoor learning. *National Foundation for Educational Research and King's College London*.

Severinus, P. (1571). *Ideal of Philosophical Medicine*.

Sharing Environmental Education Knowledge (SEEK) Minnesota. (2014, November 1). SEEK resources for northeast: residential environmental learning centers. Retrieved from http://www.seek.state.mn.us/region_detail.cfm?region=Northeast

Sharp, L. B. (1943). Outside the classroom. *The Educational Forum*, *7*(4), 363–364.

Stevenson, K. T., Peterson, M., Bondell, H. D., Mertic, A. G., & Moore, S. E. (2006). Environmental, Institutional, and Demographic Predictors of Environmental Literacy among Middle School Children. *Plos ONE*, *8*(3), 1–11. doi:doi:10.1371/journal.pone.0059519

Storksdieck, M. (2006). *Field trips in environmental education* (Doctoral). Luneburg University, Luneburg, Germany.

Tal, R. (2001). Incorporating field trips as science learning environment enrichment- an interpretive study. *Learning Environments Research*, *4*(1), 25–49. doi:10.1023/A:1011454625413

Tal, R., Bamberger, Y., & Morag, O. (2005). Guided school visits to natural history museums in Israel: teachers' roles. *Science Education*, *89*(6), 920–935. doi:10.1002/sce.20070

Tal, T., Alon, N. L., & Morag, O. (2014). Exemplary practices in field trips to natural environments. *Journal of Research in Science Teaching*, *51*(4), 430–461. doi:10.1002/tea.21137

Tamir, P. (1991). Factors Associated with the relationship between formal, informal, and nonformal science learning. *Journal of Environmental Education*, *22*(2), 34–42.

UNESCO-UNEP. (1976). The Belgrade Charter. *Connect: UNESCO-UNEP Environmental Education Newsletter*, *1*(1), 1–2.

Wade, K. (1996). EE teacher inservice eduation: the need for new perspectives. *The Journal of Environmental Education, 27*(2), 11-17.

Whittier, L. (2000). *Integrating residential environmental education into the classroom: a survey of teachers and environmental educators.* (Unpublished Master's thesis). University of Minnesota Duluth, Duluth, MN.

Appendix A

RELC Questionnaire

Page - 1

Consent Form
Practices in Environmental Education Fields Trips

Dear Participating RELC Education or Program Director,

You are invited to be in a research study of how field trips to residential environmental learning centers (RELCs) are connected to formal curriculum. You were selected as a participant because your RELC provides residential environmental education programs to Minnesota schools.

The purpose of this study will be to describe how Minnesota teachers connect field trips to RELCs to formal classroom curriculum through preparation and follow-up activities. In addition, I want to learn about the kind of support and resources RELCs provide teachers to facilitate preparation and follow-up for field trips to their facilities.

If you agree to be in this study, I am asking you to do the following:
Complete this online Campus Labs questionnaire which takes about 5-10 minutes to complete. The questionnaire asks questions about the types of preparation and follow-up resources your RELC provides teachers who bring their students to your center.

The results of this study are anonymous. Your name and contact information will not be connected to your responses to the Campus Labs online questionnaire. No one, including the researcher, will know or be able to identify your specific responses to the survey.

Your participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota.

If you decide to participate, **you are free to not answer any question by responding "NA"** or withdraw at any time without affecting those relationships. **Please only take the survey once.**

After reading this letter please ask any questions you may have. You may contact me at (612) 644-7543 or flobe011@d.umn.edu. My advisor for this study is Dr. Ken Gilbertson and you may also contact him at (218) 726-6258.

Please complete the questionnaire by **MARCH 13, 2015**.

By completing the questionnaire you are giving your consent to participate in this study. To continue, click on the "next" button below.

Thank you for your assistance. Your responses are extremely valuable to this study and I greatly appreciate your help.

Sincerely,

Kathleen Floberg
MEEd Candidate Chair
University of Minnesota

Ken Gilbertson, Ph. D.
MEEd Thesis Committee
Duluth University of Minnesota, Duluth

Required answers: 0 *Allowed answers: 0*

Next Page:

Page - 2

Please answer all of the following questions by referencing your RELC's practices in your residential environmental education programming

Part I: What does your RELC send to schools?

Directions: Please select the MOST correct answer for each question

Required answers: 0 *Allowed answers: 0*

Q1 Does your RELC provide **preparation** material to teachers **prior** to their visit? Please select the MOST correct answer.

- Yes
- No *(Go To Page 5)*
- Don't know
- Other, please comment below*[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 3

Directions: Please select the MOST correct answer for each question

Q2 Are these preparation materials **only** available upon request? Please select the MOST correct answer.

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q3 Does your RELC send supporting information (i.e. information on native plants and/or animals) which will support learning at your center to teachers **prior** to their visit? Please select the MOST correct answer.

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q4 Does your RELC provide **preparation lessons** to be conducted in the classroom **prior** to the students' visit? Please select the MOST correct answer.

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q5 Does your RELC provide **preparation activities** to be conducted in the classroom **prior** to the students' visit? Please select the MOST correct answer.

Yes
No
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 4

Directions: Please select the MOST correct answer

Q6 Do the suggested preparation lessons and/or activities indicate which Minnesota academic state standard(s) and/or benchmarks(s) they address? Please select the MOST correct answer.
Yes
No
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 5

Directions: Please select the MOST correct answer for each question

Q7 Does your RELC provide **follow-up** materials to teachers? Please select the MOST correct answer.
Yes
No *(Go To Page 8)*
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 6

Directions: Please select the MOST correct answer for each question

Q8 Are these materials **only** available upon request? Please select the MOST correct answer.
Yes
No
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Q9 Does your RELC send supporting information (i.e. information on native plants and/or animals) which supports learning at your center to teachers **after** to their visit? Please select the MOST correct answer.
Yes
No

Don't know

Other, please comment below *[Textbox]*

NA

Required answers: 1 *Allowed answers: 1*

Q10 Does your RELC provide **follow-up lessons** to be conducted in the teacher's classroom **after** their visit? Please select the MOST correct answer.

Yes

No

Don't know

Other, please comment below *[Textbox]*

NA

Required answers: 1 *Allowed answers: 1*

Q11 Does your RELC provide **follow-up activities** to be conducted in the teacher's classroom **after** their visit? Please select the MOST correct answer.

Yes

No

Don't know

Other, please comment below *[Textbox]*

NA

Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 7

Directions: Please select the MOST correct answer for each question

Q12 Do the suggested **follow-up** lessons and/or activities indicate which Minnesota academic state standard(s) and/or benchmarks(s) they addressed? Please select the MOST correct answer.

Yes

No

Don't know

Other, please comment below *[Textbox]*

NA

Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 8

Part II: Your attitude toward preparation and/or follow-up

Directions: Please indicate the level to which you agree with the following statements. Please click on the item that MOST applies to your RELC

Q13 Our **preparation** materials indicate how to connect the field trip content with formal classroom curriculum.

Strongly disagree

Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q14 Our **follow-up materials** indicate how to connect the field trip content with formal classroom curriculum
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Appendix B

Teacher Questionnaire

Page - 1

Consent Form
Practices in Environmental Education Fields Trips

Dear Participating Teacher,

You are invited to be in a research study of how field trips to residential environmental learning centers are connected to formal curriculum. You were selected as a participant because you and your students participated in a multi-day field trip at a Minnesota residential environmental learning center (RELC).

The purpose of this study will be to describe how Minnesota teachers connect field trips to RELCs to formal classroom curriculum through preparation and follow-up activities.

If you agree to participate in this study, you would be asked to do the following:
Complete this online CampusLabs questionnaire which takes about 15-25 minutes to complete. The questionnaire asks questions about the types of preparation and follow-up you conducted with your students before and after your field trip to a residential environmental learning center.

The results of this study are anonymous. Your name and contact information will not be connected to your responses to the Campus Labs online questionnaire. No one, including the researcher, will know or be able to identify your specific responses to the survey.

Your participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or Minnesota residential environmental learning centers.

If you decide to participate, **you are free to not answer any question by responding "NA"** or withdraw at any time without affecting those relationships. **Please only take the survey once.**

After reading this letter please ask any questions you may have. You may contact me at (612) 644-7543 or flobe011@d.umn.edu. My advisor for this study is Dr. Ken Gilbertson and you may also contact him at (218) 726-6258.

Please complete the questionnaire by **MARCH 6, 2015**.

By completing the questionnaire you are giving your consent to participate in this study. To continue, click on the "next" button below.

Thank you for your assistance. Your responses are extremely valuable to this study and I greatly appreciate your help.

Sincerely,

Kathleen Floberg
MEEd Candidate Chair
University of Minnesota

Ken Gilbertson, Ph. D.
MEEd Thesis Committee
Duluth University of Minnesota, Duluth

Required answers: 0 *Allowed answers: 0*

Next Page:

Page - 2

Part I: Your participation in field trips to a residential environmental learning center (RELC) you visited with your students.

Directions: Please select the MOST correct answer for each question. To skip a question, please select "NA"

Q1 Which year did you **most recently** accompany students on a multi-day field trip to a residential environmental learning center? Please select the MOST correct answer, and to skip the question please select "NA".

- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014
- 2014-2015
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q2 How many times have **you** accompanied **your** students on a field trip to an RELC? Please select the MOST correct answer, and to skip the question please select "NA"

- None
- 1-2
- 3-4
- 5-6
- More than 6
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q3 Did **you** serve as the **primary contact** teacher for the field trip during your **most recent** visit to an RELC? Please select the MOST correct answer, and to skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q4 Have **you** served as the **primary contact** teacher for a field trip to an RELC **in the past**? Please select the MOST correct answer, and to skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q5 How many time have **you** served as the **primary contact** teacher for field trips to RELCs for your students? Please select the MOST correct answer, and to skip the question please select "NA"

None
1-2
3-4
5-6
More than 6
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 3

Part II: The types of PREPARATION you and your students did in your classroom BEFORE the RELC field trip to connect the field trip content with your classroom curriculum. All questions address your field trip during your most recent visit.

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q6 **Before** your visit to the RELC, did you conduct any type of **preparation** with your students for the field trip focused on connecting the field trip experience with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"
Yes
No *(Go To Page 10)*
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 4

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q7 Did **you** teach a lesson **before** the field trip which related the field trip content with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"
Yes
No *(Go To Page 6)*
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 5

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q8 How many lessons did **you** teach **before** the field trip which related the field trip content with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"

1
2
3
4
5
More than 5
An entire unit was dedicated to connecting the field trip content with the classroom curriculum
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 6

Directions: Please indicate <u>how much</u> you conducted other types of PREPARATION with your students focused on connecting the field trip content with your classroom curriculum. To skip a question please select "NA"

Q9 Class discussions
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q10 Student projects about the field trip
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q11 Reflection (i.e. journaling)
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q12 I wove field trip related themes, concepts, or examples into my classroom curriculum
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q13 I used a field trip related theme to integrate a number of lessons and/or units in my curriculum
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q14 Other: Please describe on next page. If not applicable, please select "NA"
Never *(Go To Page 8)*
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA*(Go To Page 8)*
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 7

Q15 Please describe the other types of **preparation** you conducted with your students to connect the field trip content with your classroom curriculum **prior** to your visit to the RELC.
[Textbox]
Display if Q14='Very rarely' OR Q14='Rarely' OR Q14='Occasionally' OR Q14='Frequently' OR Q14='Very frequently'

Next Page: Sequential

Page - 8

Directions: Please indicate <u>how much</u> you agree with the following statement. To skip the question please select "NA"

Q16 Classroom preparation which integrates the formal classroom curriculum with the field trip content is valuable.
Strongly disagree
Disagree

Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Directions: Please indicate <u>how much</u> you agree with the following statement. To skip the question please select "NA"

Q17 I was able to integrate my classroom curriculum with the field trip content through preparation activities
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Directions: Please indicate <u>how much</u> you agree with each of the following. To skip the question please select "NA"

Prior to the field trip, the following **prevented** me from integrating my classroom curriculum with the field trip content to the extent that I desired

Q18 Lack of class time
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q19 Lack of formal training
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q20 Lack of resources
Strongly disagree
Disagree
Neither agree nor disagree
Agree

NA
Required answers: 1 *Allowed answers: 1*

Q21 Lack of time (too close to the beginning of the school year)
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q22 Other, please describe on next page. If not applicable, please select "NA"
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA*(Go To Page 12)*
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 9

Q23 Please describe what else **prevented** you from integrating your classroom curriculum with the field trip content through **preparation** activities to the extent that you desired
[Textbox]
Display if Q22='Strongly disagree ' OR Q22='Disagree ' OR Q22='Neither agree nor disagree ' OR Q22='Agree ' OR Q22='Strongly agree'

Next Page: Sequential

Page - 10

Directions: Please indicate <u>how much</u> you agree with the following. To skip the question please select "NA"

The following **prevented** me from integrating my classroom curriculum with the field trip content through **preparation** activities

Q24 Lack of class time
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q25 The field trip was too early in the year
Strongly disagree

Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q26 Lack of resources
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q27 Did not feel it was necessary
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q28 Did not receive training on how to integrate field trip content with formal curriculum
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q29 Other: Please describe on next page. If not applicable, please select "NA"
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA*(Go To Page 12)*
Required answers: 1 *Allowed answers: 1*

Display if Q6='No'

Next Page: Conditional

Page - 11

Q30 Please describe what else **prevented** you from integrating your classroom curriculum with the field trip

content through **preparation** activities

[Textbox]

Display if Q29='Strongly disagree ' OR Q29='Disagree ' OR Q29='Neither agree nor disagree ' OR Q29='Agree ' OR Q29='Strongly agree'

Next Page: Sequential

Page - 12

Part III: The types of FOLLOW-UP you and your students did in your classroom AFTER the RELC field trip to connect the field trip content with your classroom curriculum. All questions address your field trip during your most recent visit.

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Required answers: 0 *Allowed answers: 0*

Q31 **After** your visit to the RELC, did you conduct any type of **follow-up** with your students focused on connecting the field trip experience with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"

- Yes
- No *(Go To Page 20)*
- Don't know
- Other, please comment below *[Textbox]*
- NA

Next Page: Conditional

Page - 13

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q32 Did **you** teach a lesson **after** the field trip which related the field trip content with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"

- Yes
- No *(Go To Page 15)*
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 14

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q33 How many lessons did **you** teach **after** the field trip which related the field trip content with your classroom curriculum? Please select the MOST correct answer, and to skip the question please select "NA"

- 1
- 2
- 3
- 4
- 5

More than 5
An entire unit was dedicated to connecting the field trip content with the classroom curriculum
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 15

Directions: Please indicate <u>how much</u> you conducted other types of FOLLOW-UP with your students focused on connecting the field trip content with your classroom curriculum. To skip the question please select "NA"

Q34 Class discussions
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q35 Student projects about the field trip
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q36 Reflection (i.e. journaling)
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q37 I wove field trip related themes, concepts, or examples into my classroom curriculum
Never
Very rarely
Rarely

Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q38 I used a field trip related theme to integrate a number of lessons and/or units in my curriculum
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q39 Other: Please describe on next page. If not applicable, please select "NA"
Never *(Go To Page 17)*
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA*(Go To Page 17)*
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 16

Q40 Please describe the other types of **follow-up** you conducted with your students to connect the field trip content with your classroom curriculum **after** to your visit to the RELC.
[Textbox]
Display if Q14='Very rarely' OR Q14='Rarely' OR Q14='Occasionally' OR Q14='Frequently' OR Q14='Very frequently'

Next Page: Sequential

Page - 17

Directions: Please indicate <u>how much</u> you agree with the following statement. To skip the question please select "NA"

Q41 Follow-up activities which integrate the formal classroom curriculum with the field trip content are valuable.
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Directions: Please indicate <u>how much</u> you agree with the following statement. To skip the question please select "NA"

Q42 I was able to integrate my classroom curriculum with the field trip content through follow-up activities
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 18

Directions: Please indicate <u>how much</u> you agree the following. To skip the question please select "NA"

After the field trip, the following **prevented** me from integrating my classroom curriculum with the field trip content to the extent that I desired

Q43 Lack of class time
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q44 Lack of formal training
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q45 Lack of resources
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q46 Lack of time (too close to the end of the school year)

Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q47 Other: Please describe on next page. If not applicable, please select "NA"
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA(*Go To Page 22)*
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 19

Q48 Please describe what else **prevented** you from integrating your classroom curriculum with the field trip content through **follow-up** activities to the extent that you desired
[Textbox]
Display if Q47='Strongly disagree ' OR Q47='Disagree ' OR Q47='Neither agree nor disagree ' OR Q47='Agree ' OR Q47='Strongly agree'

Next Page: Sequential

Page - 20

Directions: Please indicate <u>how much</u> you agree with each of the following statement. To skip the question please select "NA"

The following **prevented** me from integrating my classroom curriculum with the field trip content through **follow-up** activities

Q49 Lack of class time
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q50 The field trip was too close to the end of the school year
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA

Required answers: 1 *Allowed answers: 1*

Q51 Lack of resources
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q52 I did not feel it was necessary
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q53 I did not receive training on how to integrate field trip content with formal curriculum
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q54 Other: Please describe on next page. If not applicable, please select "NA"
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA*(Go To Page 22)*
Required answers: 1 *Allowed answers: 1*

Display if Q31='No'

Next Page: Conditional

Page - 21

Q55 Please describe what else **prevented** you from integrating your classroom curriculum with the field trip content through **follow-up** activities to the extent that you desired
[Textbox]

Display if Q54='Strongly disagree ' OR Q54='Disagree ' OR Q54='Neither agree nor disagree ' OR Q54='Agree ' OR Q54='Strongly agree'

Next Page: Sequential

Page - 22

Part IV: The types of RESOURCES you obtained from the RELC before and after your field trip to the RELC for <u>your most recent visit</u>.

Directions: Please select the MOST correct answer for each question, and to skip a question please select "NA"

Q56 Were you informed of the overarching concepts and themes of the field trip **prior** to the field trip? Please select the MOST correct answer, and to skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q57 **Prior** to the field trip, were you informed of the lessons and activities your students would **participate in at the RELC**? Please select the MOST correct answer.

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q58 Were you provided with lesson plans/descriptions of the **classes provided at the RELC before** the field trip? Please select the MOST correct answer, or to skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q59 Were you provided with lesson plans/descriptions of the **classes provided at the RELC after** the field trip? Please select the MOST correct answer. or to skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q60 Did the lesson plans/descriptions of the **classes provided at the RELC** indicate which Minnesota state standard(s) and/or benchmark(s) they addressed? Please select the MOST correct answer, or the skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 23

Directions: Please select ALL that apply

Q61 How did you acquire **preparation** materials from the RELC? Please select ALL that apply, or the skip the question please select "NA"

- RELC Website
- They were emailed to me
- Another teacher gave them to me
- I specifically requested them from the RELC
- I did not receive preparation materials *(Go To Page 26)*
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 7*

Next Page: Conditional

Page - 24

Q62 Did the resources provided by the RELC come with **preparation activity** suggestions to conduct **in your classroom prior** to your visit? Please select the MOST correct answer, or to skip the question pleas select "NA"

- Yes
- No
- Don't know
- Other *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Q63 Did the resources provided by the RELC come with **preparation lesson** suggestions to conduct **in your classroom prior** to your visit? Please select the MOST correct answer, or the skip the question please select "NA"

- Yes
- No
- Don't know
- Other, please comment below *[Textbox]*
- NA

Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 25

Directions: Please indicate <u>how much</u> you did each of the following. To skip a question, please select "NA"

Q64 I used the **preparation** materials to integrate the field trip content with my classroom curriculum **before** the field trip

- Never
- Very rarely
- Rarely

Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q65 I used the lesson plans/descriptions of the classes provided at the RELC to integrate the field trip content with my classroom curriculum **before** the field trip.
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 26

Directions: Please select ALL that apply

Q66 How did you acquire **follow-up** material from the RELC? Please select ALL that apply, or to skip the question please select "NA"
RELC Website
They were emailed to me
Another teacher gave them to me
I specifically requested them from the RELC
I did not receive follow-up materials *(Go To Page 29)*
Other *[Textbox]*
NA
Required answers: 1 *Allowed answers: 7*

Next Page: Conditional

Page - 27

Directions: Please select the MOST correct answer. To skip a question, please select "NA"

Q67 Did the resources provided by the RELC come with **follow-up activity** suggestions to conduct **in your classroom after** to your visit? Please select the MOST correct answer, or to skip the question please select "NA"
Yes
No
Don't know
Other *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Q68 Did the resources provided by the RELC come with **follow-up lesson** suggestions to conduct **in your classroom after** to your visit? Please select the MOST correct answer, or to skip the question please select

"NA"
Yes
No
Don't know
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 28

Directions: Please indicate <u>how much</u> you did the following. To skip a question, please select "NA"

Q69 I used the **follow-up** materials to integrate the field trip content with my classroom curriculum **after** the field trip.
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Q70 I used the lesson plans/descriptions of the classes provided at the RELC to integrate the field trip content with my classroom curriculum **after** the field trip.
Never
Very rarely
Rarely
Occasionally
Frequently
Very frequently
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Page - 29

Directions: Please indicate <u>how much</u> you agree with each of the following. To skip a question, please select "NA"

Resources are most useful if they:

Q71 List state academic standards/benchmarks
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA

Required answers: 1 *Allowed answers: 1*

Q72 Orient students and teachers to field trip content
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q73 Orient students and teachers to the field trip location and setting
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA
Required answers: 1 *Allowed answers: 1*

Q74 Other: Please describe on next page. If not applicable, please select "NA"
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree
NA*(Go To Page 31)*
Required answers: 1 *Allowed answers: 1*

Next Page: Conditional

Page - 30

Q75 Directions: Please describe **other types** of resources that would be useful
[Textbox]
Display if Q74='Strongly disagree ' OR Q74='Disagree ' OR Q74='Neither agree nor disagree ' OR Q74='Agree ' OR Q74='Strongly agree'

Next Page: Sequential

Page - 31

Q76 Directions: Please list the types of resources that would **enhance the integration** the field trip experience with your classroom curriculum.
[Textbox]

Next Page: Sequential

Page - 32

Part V: Demographic questions

Directions: Please select ALL that apply. To skip a question, please select "NA"

Q77 What grade did you teach at the time of your **most recent** field trip to an RELC with your students? Please select ALL that apply.
Kindergarten
1st grade
2nd grade
3rd grade
4th grade
5th grade
6th grade
7th grade
8th grade
9th grade
10th grade
11th grade
12th grade
NA
Required answers: 1 *Allowed answers: 14*

Q78 What subject did you teach at the time of your **most recent** field trip to an RELC with your students? Please select ALL that apply.
I taught all core subjects to my grade
Biology
Chemistry
Physics
English
Foreign Language
Language Arts
History
Social Science
Math
Art
Music
Theater
Earth and Space Science
Physical Education
Special Education
Other *[Textbox]*
NA
Required answers: 1 *Allowed answers: 18*

Next Page: Sequential

Page - 33

Directions: Please select the MOST correct answer for each question. To skip a question, please select "NA"

Q79 What type of school did you work at during your **most recent** field trip to an RELC with your students? Please select the MOST correct answer.
Public

Private
Charter
Other, please comment below *[Textbox]*
NA
Required answers: 1 *Allowed answers: 1*

Q80 How many years have you been teaching? Please select the MOST correct answer.
1-2 years
3-4 years
5-6 years
7-8 years
9-10 years
More than 10 years
Don't know
NA
Required answers: 1 *Allowed answers: 1*

Next Page: Sequential

Appendix C

RELC Letter of Support

(Date)

Kathleen Floberg
2417 E 3rd St.
Duluth, MN 55812

Dear Kathleen,

The ____(RELC)_____ gives you full support to survey us and teachers who participate in our residential programming for your study on how multi-day field trips are integrated into the formal classroom. This includes helping distribute surveys to teachers per your sampling methods and sending out reminder notices. In return, we ask for a copy of your Thesis.

We look forward to participating in your Masters in Environmental Education field project through the University of Minnesota, Duluth (UMD).

Sincerely,

(Name)
(Title)

Appendix D

RELC Introduction Email with Survey Link

Hello participating RELC,

Thank you so much for your help and support through this process. Please take a moment to complete an online survey which takes about **5-10 minutes to complete**. The survey asks about the types of preparation and follow-up resources your RELC provides teachers who bring their students to your center. **All results are anonymous.**

Please follow the link below to the Consent Form and the survey:
http://studentvoice.com/uom/relcresources

Please only take the survey once. If you would like to participate, please do so by **March 13th, 2015.**

Thank you,
Kathleen

Appendix E

Teacher Introduction Email with Survey Link

Hello,

I am working in collaboration with Minnesota residential environmental learning centers on my thesis field project through the University of Minnesota Duluth were I am seeking a Masters of Environmental Education degree. My study is focused on how Minnesota teachers who participate in overnight field trips with their students to residential environmental learning centers integrate these experiences into formal curricula. The electronic survey will take about 20-25 minutes to complete. **All results are anonymous**

Please follow the link below to the Consent Form and the survey:
http://studentvoice.com/uom/relcfieldtrips

Please only take the survey once. If you would like to participate, please do so by **March 6th, 2015.**

Thank you,
Kathleen Floberg

Appendix F

Reminder Emails

Hello,

This is a reminder about the link to the electronic survey you received last week. I am working in collaboration with Minnesota residential environmental learning centers on my thesis field project through the University of Minnesota Duluth were I am seeking a Masters of Environmental Education degree. My study is focused on how Minnesota teachers who participate in overnight field trips with their students to residential environmental learning centers integrate these experiences into formal curricula. The electronic survey will take about 20-25 minutes to complete. **All results are anonymous.**

If you have already completed the survey, thank you for your participation!

Please only take the survey once. If you would like to participate, please do so by **March 6th, 2015.**

Follow the link below to the Consent Form and the survey:
http://studentvoice.com/uom/relcfieldtrips

Thank you,
Kathleen